
A SYNOPSIS OF
MATELEA SUBG.
DICTYANTHUS
(APOCYNACEAE:
ASCLEPIADOIDEAE)¹

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ABSTRACT

Matelea subg. *Dictyanthus* comprises thirteen currently known species ranging from northwestern Mexico to southern Nicaragua. One of the species is provided with a new combination, *M. aenea*, and five are described as new, *M. eximia*, *M. hamata*, *M. lauta*, *M. macvaughiana*, and *M. suffruticosa*. The synopsis provides descriptions and a key.

The genus *Dictyanthus* was described by Decaisne in de Candolle's *Prodromus* in 1844. The description was based on a Sessé & Mociño collection which had been distributed by Pavón. A few years later, sometime in the late 1840s, *Dictyanthus pavonii* was introduced into European botanical gardens and became relatively well known. During this period the species was illustrated in horticultural journals and was provided with several new names. The next treatment of the genus was that of Bentham & Hooker in their *Genera Plantarum* (1876). They considered the genus to comprise three or four Mexican species. Six years later, Hemsley (1882) treated the genus in *Biologia Centrali-Americana, Botany* and recognized four species, one of which was described as new. In Engler & Prantl's *Die natürlichen Pflanzenfamilien*, Schumann (1895) again considered *Dictyanthus* to be a Mexican genus of three or four species. Next, Standley in his *Trees and Shrubs of Mexico* (1924) included six species, one of which was described as new. Woodson (1941), in providing a generic revision of the North and Central American Asclepiadaceae, reduced *Dictyanthus* to a subgenus of *Matelea* and made new combinations for the ten species he recognized. These were listed with partial synonymy to document the subgenus. In the present treatment there are recognized seven of the species Woodson listed, two are reduced to synonymy, and one is excluded from the subgenus. To these are added five new species and one species

resurrected from Woodson's synonymy. Finally, Standley & Williams (1969) included the two Guatemalan species of the subgenus in their treatment of Asclepiadaceae in *Flora of Guatemala*. This summarizes the taxonomic history of *Dictyanthus*, except for the description of individual species. Since Woodson's generic revision, no species have been added to or removed from the subgenus, and no species belonging to the group have been described since 1930.

Matelea belongs to the New World tribe Gonolobeae, which can be distinguished within the subfamily by having the pollinia partially sterile and excavated on one or both faces and oriented more or less horizontally along the margin of the style apex. Woodson (1941) recognized three genera in the tribe, *Matelea*, *Gonolobus*, and *Fischeria*, reducing many previously recognized genera to synonymy. While the larger generic concepts offer significant advantages, it seems clear that reinstating some segregates would improve all the circumscriptions. *Matelea* is the least satisfactory of the concepts but, although certain small segregates, notably *Macroscepis* and *Pherotrichis*, can easily be recognized, the bulk of the species require more careful consideration than has yet been possible. Most of Woodson's subgenera of *Matelea* are ill-conceived, but *Dictyanthus* is such a distinctive group that Woodson expressed some misgivings about submerging it. He correctly noted, however, that *Matelea altatensis* (Brandegge)

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Woodson, which he included in subgenus *Dictyanthus*, is intermediate with the larger group of *Matelea*. To *M. altatensis*, which is here excluded from the subgenus, can be added the additional intermediate species *M. aspera* (Miller) W. D. Stevens and *M. sepicola* W. D. Stevens. Subgenus *Dictyanthus* is separated from the rest of *Matelea* by having the corona deeply five-lobed with the axis of each lobe entirely adnate to the corolla; also partially diagnostic are 1) simple inflorescences, 2) a mixed indumentum with at least some of the trichomes glandular and at least some of the long trichomes uncinata, and 3) narrowly fusiform follicles with thickish projections. Thus, while adequate generic and subgeneric circumscriptions within the Gonolobeae are yet to be established, *Dictyanthus* is an easily defined but not entirely discrete group within the current concept of *Matelea* and is here treated as such.

To interpret properly the following key and descriptions, the following should be considered. 1) The description of the indumentum has been simplified and, to a certain extent, generalized by the convention of referring to all trichomes as either short, glandular, or long and by modifying these terms as appropriate. These trichomes are, unless otherwise indicated, uniseriate and multicellular and have straight or uncinata tips. Short trichomes are less than 0.1 mm long, typically about 0.05 mm. Short trichomes on the inner surface of the corolla, when present, are somewhat different in form and have a glassy appearance when dried. Glandular trichomes are the same length to slightly shorter than the short trichomes, with which they are almost always mixed, and have a short stalk, an inflated middle, and a short apiculum. The glandular trichomes are probably not secretory, but the inflated part frequently collapses on drying, giving these the appearance of normal capitate glandular trichomes. Long trichomes are typically much longer than 0.1 mm. The maximum length of long trichomes is given only for the stem. Trichomes on other structures tend to be shorter. When only long trichomes are present on a structure, as is often the case on the leaf blade, they often occur in two discrete lengths, giving much the same appearance as mixed long and short trichomes. 2) The terminology used for describing the surfaces of the leaves and seeds is according to Stearn (1966). 3) The leaves are described essentially according to Hickey (1973). The same terminology is employed to describe the shape of the bracts, calyx lobes, and corolla lobe apices. *The leaf length has been considered to be the length of the midrib.* In all cases the leaves are described on the basis of the largest leaf of each specimen examined.

The largest leaves, especially on specimens of the erect species, tend to be near the middle of the stems; the lower leaves tend to be broader and the upper leaves tend to be narrower. 4) The inflorescence and floral characters are described only on the basis of examples in anthesis. The bracts are described on the basis of the largest bract of each inflorescence. The first bract (opposite the first flower) tends to be the largest, and the subsequent bracts are gradually reduced in size. 5) The corolla lobes are considered to be distinct from the limb; thus the corolla is composed of the tube, limb, and lobes. The descriptions of flower colors have been much simplified. In general, only the basic color pattern of the corolla has been described. This color pattern applies only to the inner surface of the corolla, and considerable care should be exercised in attempting to discern the pattern by examining the outside of pressed flowers. 6) Measurements of bipollinia are taken in lateral view and in the normal orientation they assume when removed; the depth or thickness is ignored. The length of the pollinium is measured from the point of attachment of the corpusculum to the tip, including the caudicles of most other asclepiad bipollinia; in most species of the Gonolobeae there is no sharp demarcation of the caudicles from the pollinia.

In the preparation of this synopsis, 694 specimens of 302 collections from 41 herbaria were examined. A list of the specimens examined is available on request. Ten of the thirteen species were studied in the field and nine were cultivated.

TAXONOMIC TREATMENT

Matelea subgenus **Dictyanthus** (Decaisne)

Woodson, Ann. Missouri Bot. Gard. 28: 236–237. 1941. *Dictyanthus* Decaisne in de Candolle, Prodr. 8: 605. 1844. TYPE: *Dictyanthus pavonii* Decaisne.

Tympananthe Hasskarl, Flora 47: 258–259. 1847. TYPE: *Tympananthe suberosa* Hasskarl.

Rytidoloma Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 25(2): 319–320. 1852. TYPE: *Rytidoloma reticulatum* Turczaninow.

Plants erect, trailing, or twining, herbaceous or woody, with or without a woody or fleshy caudex. Woody parts typically with thick, fissured, corky bark. Indumentum variable and often mixed; trichomes multicellular, uniseriate, simple, straight or uncinata, of 3 general types: short nonglandular, short glandular, and long nonglandular. Leaves ovate in general outline, apex mostly acuminate to attenuate, base lobate, with acropetiole collaters; exstipulate but with an interpetiole fringe of long trichomes and collaters. Inflorescence extra-axil-

lary, a condensed, simple, helicoid cyme or reduced to a single flower with or without an apparent peduncle. Calyx 5-lobed nearly to base, with 1 or 2 colleters below each sinus within. Corolla deeply to shallowly campanulate; tube mostly convoluted, with raised parts opposite corona lobes and sacs formed between them. Corona digitately 5-lobed, lobes connate below or free, adnate to gynostegium and adnate for their entire length to corolla. Gynostegium stipitate, apex \pm pentagonal and con-

cave to apiculate, terminal anther appendages covering margin of apex. Corpusculum sagittate; caudicles winged, hardly distinct from pollinia; pollinia flattened, excavated and hyaline along upper margin, obliquely obovate. Follicles fusiform, with few to numerous, thick to thin, straight to arcuate projections. Seeds obovate, flattened, with a raised, smooth or radially grooved, entire or toothed margin, the surface otherwise verrucate to rugose, pale to dark brown; with a white apical coma.

KEY TO SPECIES OF *MATELEA* SUBG. *DICTYANTHUS*

- 1a. Corolla tube with parallel vertical lines, these only occasionally with a few cross connections.
 - 2a. Pedicels less than 6 mm long; corolla lobes less than 7 mm long; corona lobes sagittate in outline, less than half the length of the corolla tube 2. *M. tuberosa*
 - 2b. Pedicels more than 6 mm long; corolla lobes more than 7 mm long; corona lobes linear to linear-spathulate in outline, more than half the length of the corolla tube.
 - 3a. Calyx and outer surface of corolla glabrous; corolla tube with ca. 5 lines between each corona lobe 6. *M. lauta*
 - 3b. Calyx and outer surface of corolla distinctly hairy; corolla tube with 15 or more lines between each corona lobe.
 - 4a. Corolla base-sinus length more than 12.5 mm, with a narrow band of short trichomes around corona lobes within; long trichomes of peduncles and pedicels mostly uncinata; twining woody vines without thickened caudices 4. *M. pavonii*
 - 4b. Corolla base-sinus length less than 12.5 mm, glabrous around corona lobes within; long trichomes of peduncles and pedicels straight; erect or weakly twining herbaceous vines with thickened caudices 5. *M. macvaughiana*
- 1b. Corolla tube with circular lines or with distinct reticulations, or without a distinct pattern.
 - 5a. Corolla entirely glabrous within; corona lobes basally connate and forming a prominent disk; inflorescence bracts more than 1.5 mm wide, elliptic in general shape 3. *M. hamata*
 - 5b. Corolla with dense short trichomes within, at least on limb; corona lobes basally connate or not, but not forming a disk; inflorescence bracts less than 1.5 mm wide, linear or ovate in general shape.
 - 6a. Corona lobes spathulate, with prominent, purple-black, deeply rugose tips; long trichomes of internodes uncinata.
 - 7a. Peduncle less than 1 mm long; calyx lobes less than 5 mm long; corolla sharply reflexed from tip of corona lobe to sinus; plants of the Isthmus of Tehuantepec 11. *M. suffruticosa*
 - 7b. Peduncle more than 1 mm long; calyx lobes more than 5 mm long; corolla not reflexed beyond corona lobe tip; plants of the Yucatan Peninsula.
 - 8a. Corolla lobes 7-12 mm long, length to width (sinus-sinus) ratio greater than 0.80, margins revolute, limb and lobes patent or slightly reflexed; corolla densely gray-purple-reticulate 13. *M. yucatanensis*
 - 8b. Corolla lobes 5-9 mm long, length to width (sinus-sinus) ratio less than 0.80, margins not revolute, limb and lobes ascending; corolla yellow-green when fresh, sometimes drying darker and somewhat reticulate 12. *M. aenea*
 - 6b. Corona lobes of various shapes but never modified as above; long trichomes of internodes rarely uncinata.
 - 9a. Corolla deeply campanulate, base-sinus length 7 mm or more, margins strongly revolute; corona lobes more than 4.5 mm long, linear or linear-spathulate.
 - 10a. Corolla tube with circular lines 7. *M. standleyana*
 - 10b. Corolla tube with a reticulate pattern or without a distinct pattern.
 - 11a. Gynostegium apex apiculate; twining vines without thickened caudices; plants from southeast of the Isthmus of Tehuantepec.
 - 12a. Corolla limb with irregular roundish reticulations, indumentum within restricted to the reticulations; septa connecting corona lobes to gynostegium each with a prominent tooth; calyx lobes 6 mm or less wide 8. *M. ceratopetala*
 - 12b. Corolla limb with circular lines only occasionally merging, the veins themselves forming a regular angular reticulum, indumentum within uniformly distributed, not restricted to veins; septa of corona entire; calyx lobes 6 mm or more wide 9. *M. eximia*
 - 11b. Gynostegium apex shallowly concave; erect or weakly twining vines, mostly from thickened caudices; plants from northwest of the Isthmus of Tehuantepec 10. *M. dictyantha*
 - 9b. Corolla shallowly campanulate to nearly rotate, base-sinus length 11 mm or less, margins slightly or not at all revolute; corona lobes less than 4.5 mm long, short-spathulate with acute apices 1. *M. hemsleyana*

1. **Matelea hemsleyana** Woodson, Ann. Missouri Bot. Gard. 28: 237. 1941, based on *Dictyanthus parviflorus* Hemsley. *Dictyanthus parviflorus* Hemsley, Biol. Cent. Amer., Bot. 2: 329. 1882, not *Matelea parviflora* (Torrey) Woodson. TYPE: México. Chiapas: "les montagnes pres in village indien de Cancun" [?Cancun, Mpio. Chilón, Chiapas], June, year not given (fl), *Ghiesbreght* 663 (holotype, K, not seen; isotypes, GH, MO, NY). Figure 1.

Dictyanthus prostratus Brandege, Univ. Calif. Publ. Bot. 7: 329. 1920, not *Matelea prostrata* (Willdenow) Woodson. *Matelea diffusa* Woodson, Ann. Missouri Bot. Gard. 28: 236. 1941, based on *Dictyanthus prostratus* Brandege. TYPE: México. Veracruz: "Acanoxica" or "Acasonica" [Acaxónica], Aug. 1919 (fl), *Purpus* 8411 pro parte (holotype, UC; isotypes, GH, MO, NY, US(2), VT).

Plants erect to trailing or rarely weakly twining. Stems 20–60(–90) cm long, with a woody caudex to 4 cm long and 2 cm wide, this with thin to thick corky bark, also often with short woody stems above caudex, these with or without corky bark, the herbaceous stems with dense short and glandular trichomes and sparse to dense, mostly straight long trichomes to 3 mm long. Leaf blade ovate to very wide-ovate, 13–34 mm long, 13–36 mm wide, with mostly uncinat long trichomes and often with scattered glandular trichomes below, surface smooth, smaller veins sharply raised below, apex acuminate to attenuate or rarely obtuse, base lobate, lobes overlapping to divergent, with 2–6(–8) acropetiole colleters, margin often somewhat thickened and revolute; petiole 7–18(–26) mm long, with dense short and glandular trichomes and sparse to dense, mostly uncinat long trichomes. Peduncle 1–4 mm long, with dense short and glandular trichomes and sparse to dense, straight or uncinat long trichomes; bracts linear or lorat to lanceolat, 2–4 mm long, with indumentum of leaf or nearly glabrous; pedicel 3–5 mm long, with indumentum of peduncle. Calyx lobes narrow-ovate or occasionally lanceolat, 4–6 mm long, 1.5–2.5 mm wide, apex acute to attenuate, with one colleter below each sinus, abaxial surface with scattered glandular trichomes and scattered to dense, straight or uncinat long trichomes, adaxial surface glabrous. Corolla shallowly campanulat, base to sinus length 3–6 mm, limb not distinct, margin slightly revolute; lobes (3–)4–6(–7) mm long, apex acute or occasionally rounded, patent or slightly reflexed at tip, margin slightly revolute; glabrous within except with dense short trichomes on limb and lobes and these sometimes extending down raised ridges

within tube, indumentum on outside of straight long trichomes or sometimes the limb and lobes nearly glabrous; tube convoluted, with the raised parts opposite the corona lobes, forming shallow pockets between them, with corona lobes in distinct pockets in bases of raised parts; moderately to densely brown-purple-reticulate, becoming clear pale purple on and around corona lobes. Corona lobes 1–1.5 mm long, basically short-spathulat with an acute apex, the upper surface with a narrow ridge extending as a short spur to edge of gynostegium. Gynostegium 1–1.5 mm high and 1.5–2 mm wide at apex, short-stipitat, apex convex and slightly bilobed. Corpusculum 0.18–0.22 mm long, 0.08–0.10 mm wide, pollinia 0.58–0.91 mm long, 0.26–0.34 mm wide. Follicles 48–70 mm long, 10–18 mm wide, green with white markings, glabrous or with sparse short and glandular trichomes, with 28–54 projections to 2 mm long, arcuate and somewhat reflexed proximally, straight and leaning forward distally. Seeds ca. 4 mm long, ca. 3 mm wide, with a raised margin, this irregularly toothed distally, inside this margin slightly convex on one side and slightly concave on the opposite side, both sides verrucate, concave side with a narrow ridge from apex to near center, apparently pale brown; coma ca. 25 mm long.

Found in Mexico (Michoacán, Estado de México, Morelos, Veracruz, Chiapas), Guatemala, and El Salvador (Fig. 2). Collected at elevations of somewhat below 800 m to nearly 2,600 m, but mostly 1,000–1,500 m, on slopes and hills, mostly in grasslands, but sometimes in open pine-oak forests, on volcanic cinder and rocky clay soils. Flowering mostly from June through September, but flowering specimens also collected once each in April and November; specimens with mature-sized fruits collected August–December.

Only those specimens of *Purpus* 8411 with the locality given as "Acanoxica" or "Acasonica" [Acaxónica] and a date of August 1919 are to be considered types of *Dictyanthus prostratus*.

Collections from the part of the range centered around the state of Morelos differ somewhat from plants in the rest of the range. Woodson, according to his annotations, considered the Morelos plants to be *Matelea hemsleyana* and the others *M. diffusa*. Standley & Williams (1969) also considered the plants from southern Mexico to El Salvador to be *M. diffusa*, but perhaps without seriously considering the plants from Morelos. Standley (1924) considered the two species to be synonymous. Plants from around Morelos tend to be shorter and more erect and to have thicker caudices, larger, more distinctly veined leaves, larger flowers (to nearly

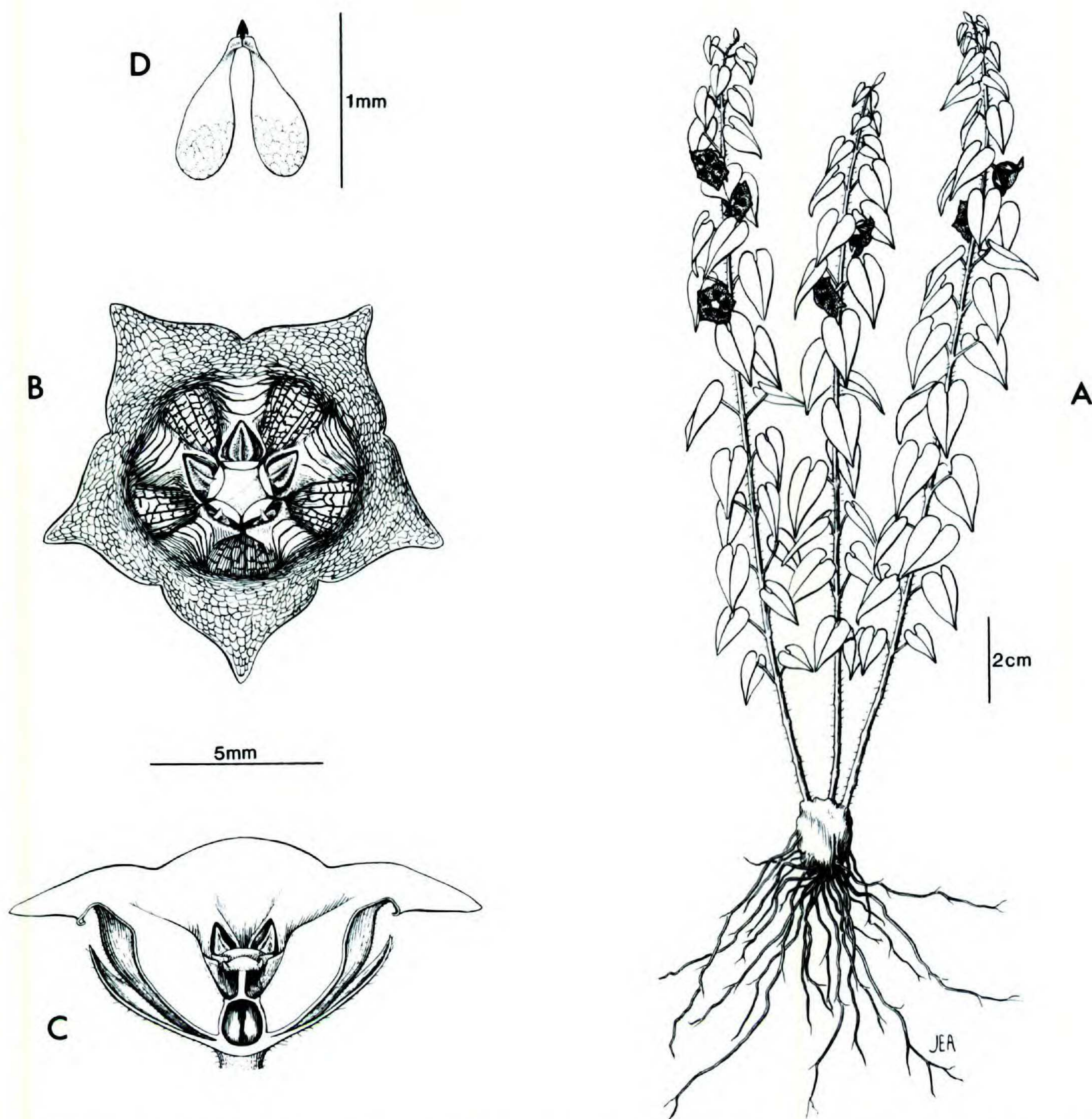


FIGURE 1. *Matelea hemsleyana* (Stevens C-162, a cultivated specimen of Stevens 1399).—A. Habit.—B, C. Flowers.—D. Bipollinium.

twice as large), and proportionately longer corona lobes. In describing *Dictyanthus prostratus* (= *Matelea diffusa*), Brandegee considered it to be different from *D. parviflorus* (= *M. hemsleyana*) in having “five minute scales attached to the middle of the gynostegium representing an inner corona.” There seems to be no such character, and the “scales” were most likely the remains of the attachments of the corona lobes to the gynostegium, which are typically torn free when the flower is pressed. Despite the differences described above, no known characters faithfully differentiate the two elements. It may well be that further collection will demonstrate that some level of taxonomic recognition is preferable. In this regard, it

is curious that this is the only species in the subgenus inhabiting both sides of the continent, a distinctly uncommon phenomenon among the viney milkweeds.

2. *Matelea tuberosa* (Robinson) Woodson, Ann. Missouri Bot. Gard. 28: 237. 1941. *Dictyanthus tuberosus* Robinson, Daedalus 27: 180–181. 1891/1892 [1893]. LECTOTYPE (here chosen): México. Jalisco: slopes of barranca near Guadalajara, 10 Sep. 1891 (fl), Pringle 3568 (lectotype, GH; islectotypes, F, VT). Lectoparatype: México. Jalisco: Guadalajara, in ravines, (15 July–3 Aug. fide McVaugh, 1956, p. 215) 1886 (fl), Palmer

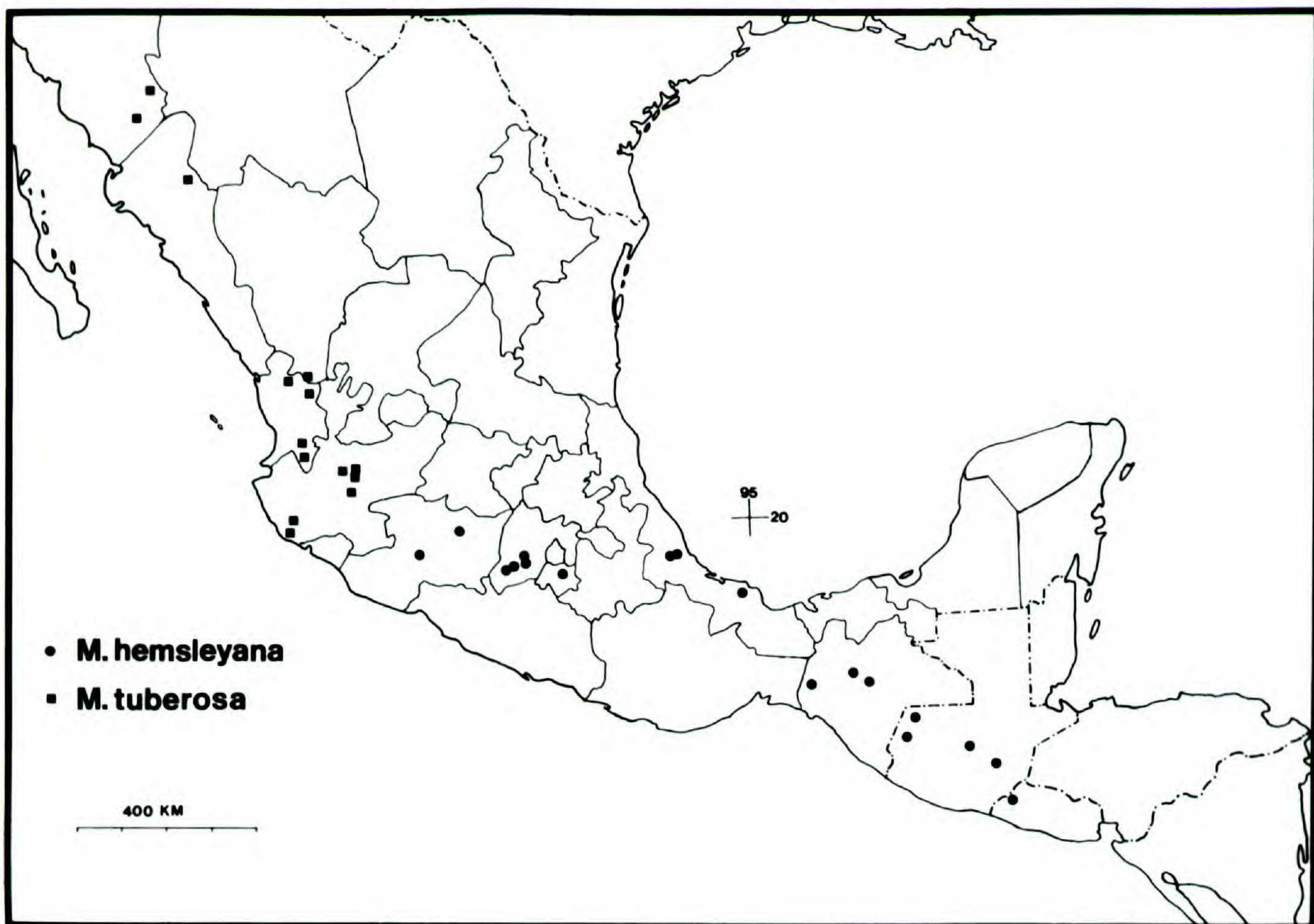


FIGURE 2. Distributions of *Matelea hemsleyana* and *M. tuberosa*.

251 (lectoparatype, GH; isoparatypes, ENCB, G, K, MO, ND, NY(2), P, PH, US, WU). Figure 3.

Plants erect to trailing or sometimes weakly twining. Stems 10–70(–100) cm long, with a woody caudex to 5 cm long and 3 cm wide, this with thick corky bark, otherwise typically herbaceous and lacking bark (rarely subshrubs with erect, branched woody stems), with dense short trichomes, very sparse glandular trichomes, and sparse to dense, mostly straight long trichomes to 2 mm long. Leaf blade ovate to very wide-ovate, 17–45 mm long, 17–40 mm wide, with mostly uncinete long trichomes, surface smooth, smaller veins sharply raised below, apex acuminate to attenuate, base lobate, lobes mostly convergent to descending, with 3–6 (–9) acropetiole colleters, margin often somewhat thickened and revolute; petiole 7–31 mm long, with dense short trichomes, very sparse glandular trichomes, and sparse to dense, mostly uncinete long trichomes. Peduncle 0.5–9 mm long, with dense short trichomes, very sparse glandular trichomes, and sparse to dense, straight or uncinete long trichomes; bracts linear or lanceolate, 2–8 mm long, with mostly uncinete long trichomes; pedicel 4–5 mm long, with indumentum of pedun-

cle. Calyx lobes lanceolate to narrow-ovate or elliptic, 5–9 mm long, 1.5–3.5 mm wide, apex acute to attenuate, with one colleter below each sinus, abaxial surface with sparse to dense, straight or uncinete long trichomes, adaxial surface glabrous. Corolla deeply campanulate, base to sinus length 6–10 mm, limb revolute; lobes 2.5–6 mm long, apex acute, slightly to strongly reflexed, margins strongly revolute; glabrous within except with dense short trichomes on limb and lobes, indumentum outside of short trichomes on tube and of straight or uncinete long trichomes on limb and lobes, occasionally with a few long trichomes scattered along tube and occasionally distal third of lobes glabrous; with a pair of ridges within tube opposite each corona lobe, ridges of adjacent pairs almost coming together at base and forming pockets at base of corolla, with the corona lobes in distinct pockets in the bases of the furrows between the paired ridges; within the tube with fine gray-brown vertical lines, limb densely gray-brown-reticulate. Corona lobes ca. 2 mm long (but borne distinctly above base of corolla), shape elaborate but basically sagittate in outline, adnate to gynostegium by a thin septum. Gynostegium ca. 2 mm high and ca. 2 mm wide at apex, stipitate, apex broadly and shal-

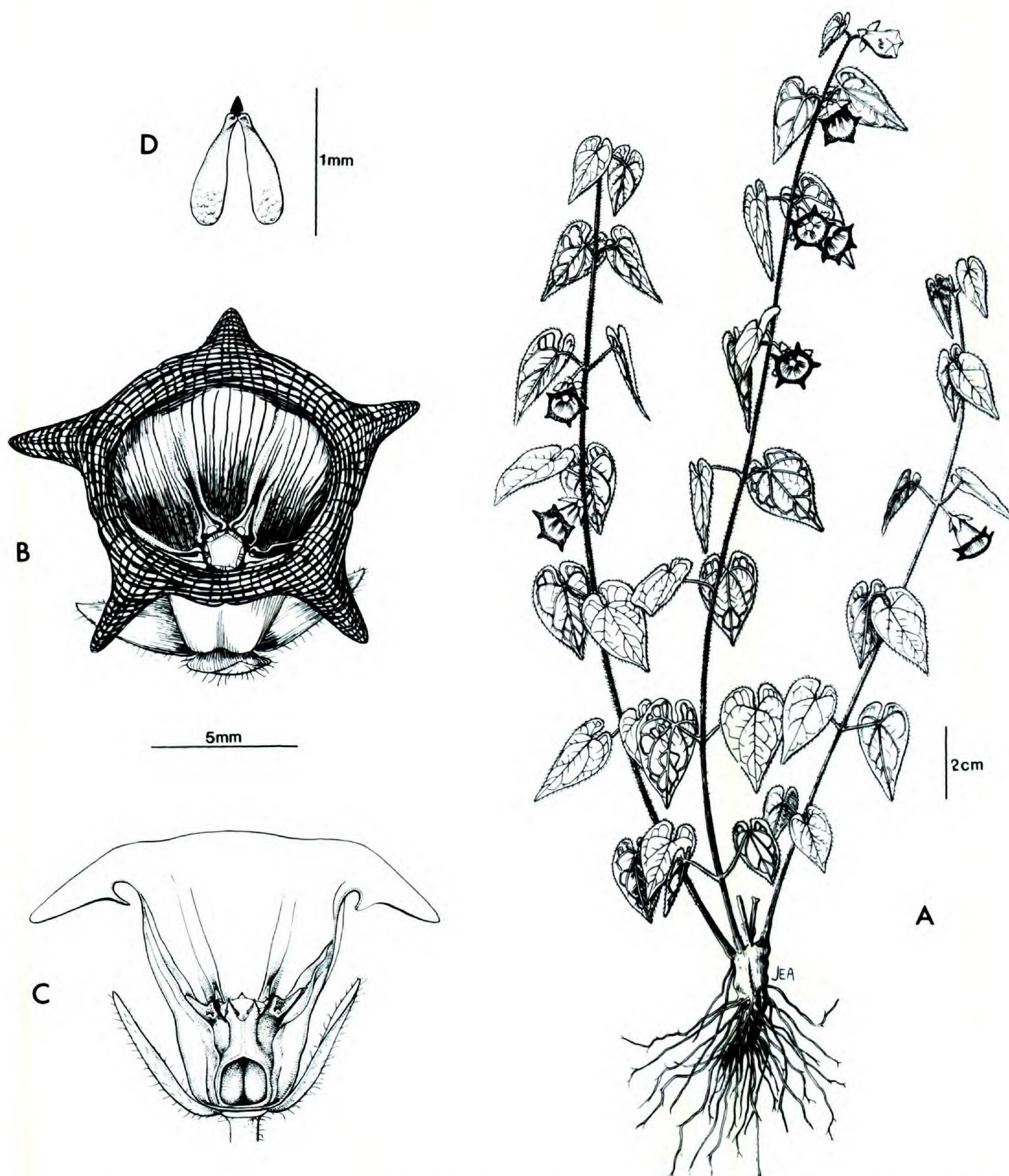


FIGURE 3. *Matelea tuberosa* (Stevens C-163 and C-164, cultivated specimens of Stevens 1458 and 1473, respectively, and Stevens 1473).—A. Habit.—B, C. Flowers.—D. Bipollinium.

lowly concave with the corpuscula as high points and slightly convex and bilobed in center. Corpusculum 0.14–0.22 mm long, 0.08–0.13 mm wide, pollinia 0.63–0.86 mm long, 0.29–0.37 mm wide. Follicles 55–65 mm long, 11–19 mm wide, mottled pale and dark green, with scattered short and long trichomes, with 50–110 arcuate projections to 2 mm long. Seeds nearly circular, 5.5–6 mm long, 4.5–5 mm wide, with a raised, radially grooved

margin, this entire to shallowly toothed distally, inside this margin slightly convex and verrucate on both sides, one side with a narrow ridge from apex to near center, pale brown; coma ca. 25 mm long.

Collected from southern Sonora to southern Jalisco (Fig. 2) at elevations of 500–1,600 m, in open oak and pine-oak forests and adjacent grass-

lands, usually in shallow, red, clay soil. Flowering specimens have been collected from late July to early October, and the one specimen with mature seeds was collected in March.

The nearly tubular corolla of this species readily distinguishes it from the other species of this subgenus and is probably unique in the genus *Matelea*.

- 3. *Matelea hamata*** W. D. Stevens, sp. nov.
TYPE: México. Guerrero: La Unión, 50 m, 29 July 1898 (fl), *Langlassé* 257 (holotype, US; isotypes, GH, P). Figure 4.

Matelea hamata W. D. Stevens; a speciebus ceteris subgeneris *Dictyanthi* pagina interiore corollae glabra et corona disciformi carnosae luteae lobis brevibus (circa 1 mm) corollae adnatis clare distinguenda.

Plants twining vines. Stems woody below, with corky bark, herbaceous stems with moderately dense short and glandular trichomes and sparse to very sparse straight or uncinete long trichomes to 1.5 mm long. Leaf blade narrow-ovate to wide-ovate, 52–113 mm long, 26–52 mm wide, with sparse to dense uncinete long trichomes, surface smooth to minutely pusticulate, apex acute to attenuate, base lobate, lobes slightly convergent to divergent, with 4–9 acropetiole colleters, margin somewhat thickened and revolute; petiole 23–61 mm long, with moderately dense short and glandular trichomes and sparse, mostly uncinete long trichomes. Inflorescence relatively elongate; peduncle 14–40(–53) mm long, with indumentum of stem; bracts narrow-elliptic to elliptic or lanceolate to narrow-ovate, 4–10 mm long, with indumentum of leaf; pedicel 7–19 mm long, with indumentum of stem. Calyx lobes lanceolate to narrow-ovate or elliptic, 10–17 mm long, 4–6.5 mm wide, apex acute or acuminate, with one colleter below each sinus, abaxial surface with moderately dense, straight or uncinete long trichomes, adaxial surface glabrous. Corolla urceolate-campanulate, base to sinus length 11–16 mm, limb broad, patent; lobes 8–13 mm long, apex obtuse or rounded, slightly recurved, margin patent; glabrous within, indumentum on outside of dense short trichomes and of moderately dense long trichomes on limb and lobes; tube shallowly convoluted, with a pair of ridges opposite and a shallow pit alternate with each corona lobe; with fine, faint, reticulate lines within the tube, limb with fine, distinct circular lines, these becoming reticulate on lobes, these lines gray-brown on a pale yellow-green background. Corona lobes connate and forming a fleshy yellow disk ca. 6.5 mm wide, lobe tips subulate and extending ca. 1 mm above rim of disk, disk adnate

to corolla base and lobe tips adnate to corolla between paired ridges, with a fleshy septum from each lobe to the gynostegium, each septum with a fleshy ornate hump. Gynostegium ca. 3 mm high and ca. 3 mm wide at apex, stipitate, apex broadly and shallowly concave with the corpuscula as high points and a slight hump in center. Corpusculum 0.22–0.24 mm long, 0.18–0.19 mm wide, pollinia 1.24–1.49 mm long, 0.41–0.48 mm wide. Fruit and seeds unknown.

Paratypes. MÉXICO. GUERRERO: near el Tuzal, ca. 3.9 mi. SE of Petatlán, ca. 80 m, 25 July 1976 (fl), *Stevens et al.* 2538 (ARIZ, DS, DUKE, ENCB, F, G, GH, L, MICH, MO, MSC, NY, P, SD, SMU, TEX, UMO, US, WIS). OAXACA: Distrito de Pochutla, camino a la Bahía de Santa Cruz, 2 km al S de la desviación, 50 m, 25 July 1982 (fl), *Cedillo et al.* 1697 (MEXU, MO).

Known only from near the coast (less than 100 m elevation) in Oaxaca and Guerrero (Figure 6), growing in clayey soil. Known flowering in July.

In many ways this is intermediate between *Matelea hemsleyana* and *M. tuberosa* on one hand and the other species of the subgenus on the other. The overall aspect of the plant, the general size and shape of the corolla, the connate corona lobes, and the size and shape of the bipollinia are essentially comparable to the larger group of species. The corona lobes, in this case the tips of the lobes, are more comparable in size, shape, and method of adnation to the corolla of *M. hemsleyana* and *M. tuberosa*. The fleshy corona disk is, however, unique. Also unique are the large, nearly foliaceous bracts, the large elliptic calyx lobes, the broad patent corolla limb, and the relatively short and blunt corolla lobes.

The holotype of this species previously had been tentatively determined as *Dictyanthus stapeliiflorus*; see the discussion of this name under *Matelea pavonii*.

- 4. *Matelea pavonii*** (Decaisne) Woodson, Ann. Missouri Bot. Gard. 28: 237. 1941. *Dictyanthus pavonii* Decaisne in de Candolle, Prodr. 8: 605. 1844. TYPE: "Pavón" (Sessé, Mociño et al. s.n.) (holotype, FI, not seen; fragment of holotype, P). Figure 5.

Stapelia campanulata Pavón ex Decaisne in de Candolle, Prodr. 8: 605. 1844, pro syn.

Tympananthe suberosa Hasskarl, Flora 47: 258–259. 1847. TYPE: unknown.

Dictyanthus campanulatus Reichenbach, Selectis e Seminario Horti Academici Dresdensis 4. 1850 (Linnaea 24: 207. 1851), nom. superfl. TYPE: unknown.

Dictyanthus stapeliiflorus Reichenbach, ll.cc. *Matelea stapeliiflora* (Reichenbach) Woodson, Ann. Missouri Bot. Gard. 28: 237. 1941. TYPE: unknown.

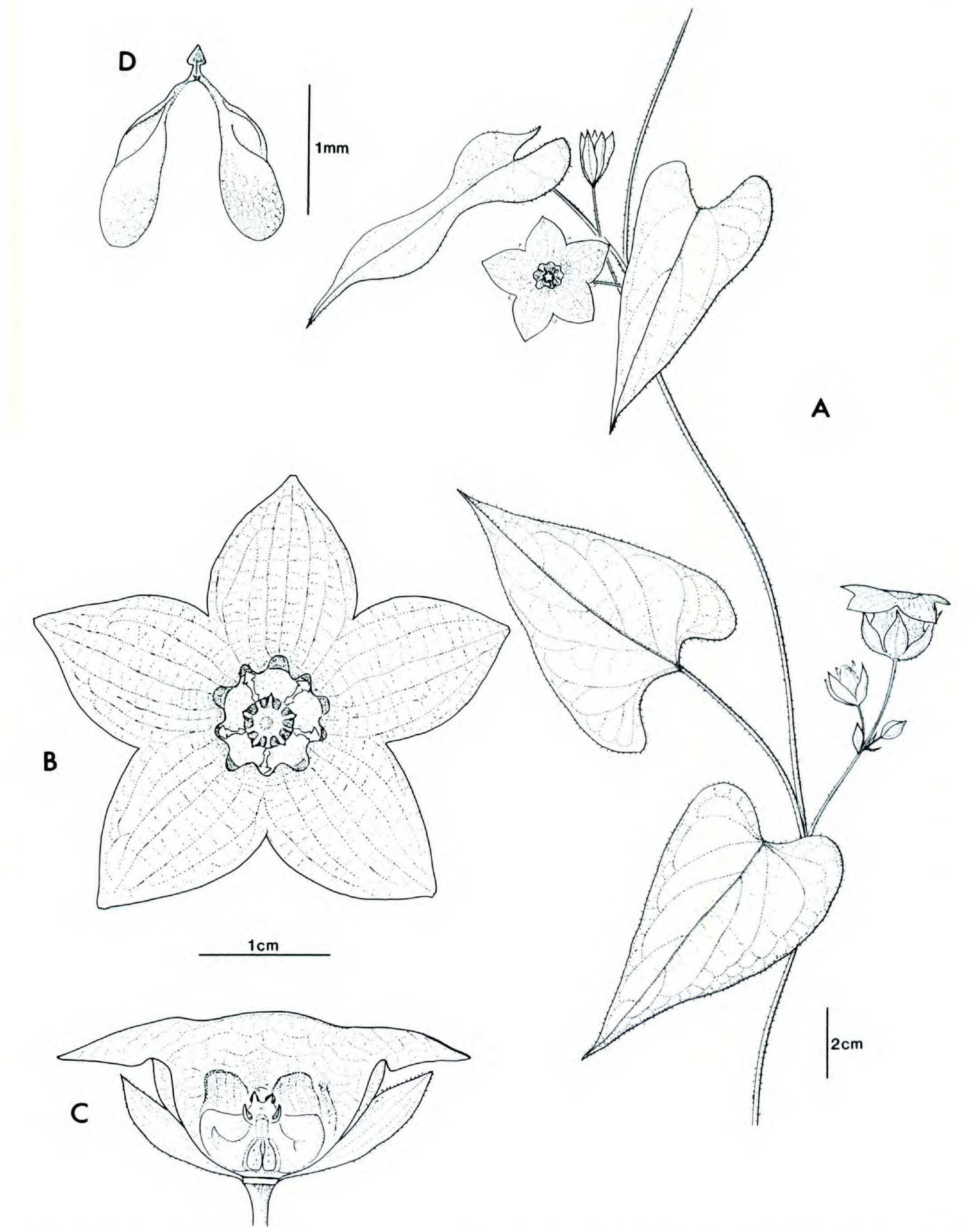


FIGURE 4. *Matelea hamata* (Stevens et al. 2538).—A. Section of flowering stem.—B, C. Flowers.—D. Bipollinium.

Stapelia campanulata Sessé & Mociño, Pl. Nov. Hisp. 41. 1888. TYPE: unknown (Sessé, Mociño et al. s.n., from mountains of Mazatlán, Guerrero).

Plants twining vines. Stems woody below, with thick or occasionally thin corky bark; herbaceous stems with sparse to dense short and glandular

trichomes and sparse to dense, straight or uncinat long trichomes to 1.5 mm long, these brittle and often missing from specimens. Leaf blade ovate to wide-ovate or rarely very wide-ovate, (49–)60–128 mm long, 29–100 mm wide, indumentum of sparse to dense uncinat long trichomes, surface

pusticulate to minutely pusticulate or occasionally nearly smooth, smaller veins occasionally slightly raised below, apex acuminate to attenuate, base lobate or very rarely cordate, lobes mostly descending to widely divergent, with (0–)1–6(–11) acropetiole colleters, margin often slightly thickened and revolute; petiole (16–)22–65(–81) mm long, with indumentum of stem. Peduncle 9–60(–90) mm long, with indumentum of stem or occasionally long trichomes absent; bracts lanceolate or occasionally lorate, narrow-oblong, very narrow-elliptic, narrow-ovate, or ovate, 4–13 mm long, with sparse to dense short and uncinat long trichomes or sometimes nearly glabrous; pedicel (7–)10–25(–32) mm long, with indumentum of stem or occasionally long trichomes absent. Calyx lobes lanceolate to narrow-ovate or rarely ovate, 9–18 mm long, 3–6(–9) mm wide, apex attenuate, with one colleter below each sinus, abaxial surface with sparse to moderately dense uncinat long trichomes, adaxial surface glabrous. Corolla campanulate, base to sinus length 13–25 mm, limb revolute; lobes 11–25 mm long, apex rounded or occasionally acute or obtuse, patent to slightly reflexed, margin revolute; glabrous within except with moderately dense short trichomes around corona lobes and on limb and lobes, indumentum on outside of very sparse to dense uncinat long trichomes except lobes distally to entirely glabrous; tube convoluted with the raised parts opposite the corona lobes and deep sacs formed between them; with brown, purple, or red vertical lines within tube, these lines becoming finer and circular on base of limb and finely to densely reticulate on distal part of limb and on lobes. Corona lobes 7–13 mm long, linear to linear-spathulate in outline, connate at base, adnate by a thin septum to gynostegium, this septum continuing as a narrow ridge nearly the length of the lobe and often with 1 or rarely 2 distinct teeth on upper margin. Gynostegium 3–6(–7) mm high and 3–4.5 mm wide at apex, stipitate, apex apiculate, the apiculum 0.5–1.5 mm long, slightly shorter than to slightly exceeding corpuscula, appearing to be papillate when dried. Corpusculum 0.31–0.38 mm long, 0.12–0.18 mm wide; pollinia 1.45–1.62 mm long, 0.42–0.48 mm wide. Follicles 70–106 mm long, 22–23 mm wide, green with pale green streaks, with dense short trichomes, bearing 18–54 projections, these thick, straight or slightly arcuate, to 4 mm long. Seeds ca. 6.5 mm long, ca. 3.5 mm wide, with a raised margin, this irregularly crenate distally, inside this margin slightly convex on one side and slightly concave on the opposite side, convex side tuber-

culate, concave side longitudinally verrucate, dark black-brown; coma ca. 25 mm long.

Collected from southernmost Sinaloa to Oaxaca (Fig. 6). Found mostly at elevations of 900–2,000 m, but also once at 2,500 m and three times at about 600–750 m. Mostly occurring in mountainous areas where pine-oak forests occupy the more exposed sites and tropical deciduous forests occupy the more protected slopes and barrancas. Found in either vegetation type but especially common in disturbed places. Apparently tolerant of a variety of substrates, including limestone, lava, weathered metamorphics, and alluvium. Flowering primarily July–September but also collected in June, October, and November. Mature fruits known only in cultivation (March).

Although there can be no question as to the proper name of this, the type species of *Dictyanthus*, the treatment of the Sessé & Mociño names and specimens has considerably complicated the synonymy. A summary of the Sessé & Mociño specimens relating to *Matelea pavonii* is provided in Table 1. A curious aspect of this summary is that two of the herbarium numbers, 3580 and 3581, are mixtures of *Matelea pavonii* and *M. standleyana*. Since these species are not known to be sympatric, the mixing probably occurred at some stage of herbarium handling. After both Sessé and Mociño had died, Pavón apparently distributed specimens from their herbarium. It was upon one of these specimens that Decaisne based his genus *Dictyanthus*. The specimen was in the Webb herbarium, which at the time was in Paris (now at FI), but Decaisne kept a fragment which is now at P. I have not seen the specimen at FI, but Dr. Rogers McVaugh has examined it. Decaisne attributed the specimen and the label name, *Stapelia campanulata*, to Pavón. The name was probably actually the same Sessé & Mociño name that was published posthumously in their *Plantae Novae Hispaniae* (1888). In that publication a locality, mountains of Mazatlán, Guerrero, and a plate, “Fl. Mex. Ic. 255,” are both cited, but these cannot be associated with any particular one of the Sessé & Mociño herbarium numbers nor with the specimen distributed by Pavón. The plate is apparently the same as the de Candolle plate 804, labeled “255,” which is at G (F neg. 30763). A small line drawing taken from the flowers of the de Candolle plate 804 is also at G (F neg. 30406) and is labeled “*Eurybia stapeliaeflora*.” This may or may not have been a Sessé & Mociño name, but was never published.

Reichenbach added to the proliferation of names

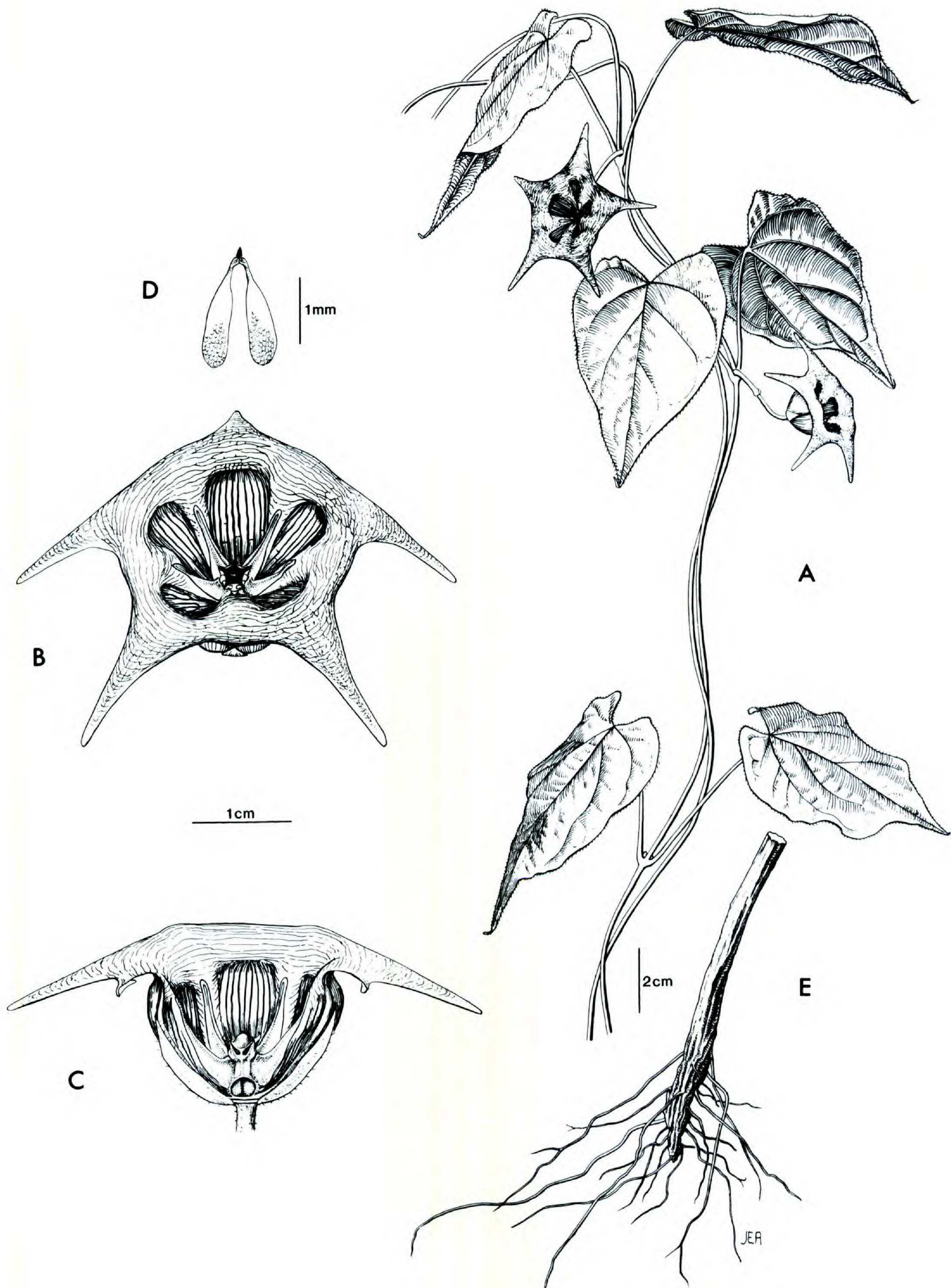


FIGURE 5. *Matelea pavonii* (A–D from Stevens C-160, a cultivated specimen of Stevens 1375; E from Stevens 1427).—A. Section of flowering stem.—B, C. Flowers.—D. Bipollinium.—E. Base of stem.

TABLE 1. *Sessé & Mociño collections pertinent to Matelea pavonii.*

Sessé & Mociño Herbarium Number	Herbarium	F Negative Number	Sessé & Mociño Label Names	Woodson's Determinations	Determinations According to This Treatment
829	MA	41470	<i>Stapelia campanulata</i>	<i>Matelea pavonii</i>	not determinable from photo, probably not subgenus <i>Dictyanthus</i> , perhaps not <i>Matelea</i>
835	MA	41471	<i>Cynanchum violaceum</i>	<i>M. pavonii</i>	probably at least partly <i>M. pavonii</i>
838	F	—	—	<i>M. pavonii</i>	<i>M. pavonii</i>
838	MA	41472	<i>C. campanulatum</i>	<i>M. pavonii</i>	<i>M. pavonii</i>
1253	MA	41473	<i>C. campanulatum</i> & <i>C. punctatum</i>	<i>M. pavonii</i>	<i>M. standleyana</i>
3580	F	—	—	<i>M. pavonii</i>	<i>M. standleyana</i>
3580	MA	41474	<i>S. campanulata</i>	<i>M. pavonii</i>	<i>M. pavonii</i>
3581	F	—	—	<i>M. pavonii</i>	<i>M. pavonii</i> plus <i>M. standleyana</i>
3581	MA	41475	<i>C. campanulatum</i>	<i>M. pavonii</i>	<i>M. pavonii</i> plus <i>M. standleyana</i>
s.n.	FI	—	<i>S. campanulata</i>	—	<i>M. pavonii</i> (not seen)
s.n.	P	—	—	—	<i>M. pavonii</i>

by describing *Dictyanthus campanulatus* and *D. stapeliiflorus*. The former, apparently as an early attempt to apply the idea of priority, is a superfluous name, since Reichenbach cited “*Stapelia campanulata* Pavón. *D. pavonii* DC. prodr. *Tympananthe suberosa* Haskarl.” *Dictyanthus stapeliiflorus* is a most problematic name. Reichenbach described both of his species from plants growing at a botanical garden in Dresden from seeds collected in Mexico at the foot of the Sierra Madre, near Durango. Apparently no specimens were prepared and neither description is alone adequate for identifying the species, but both could apply to *Matelea pavonii* and the source area would be more appropriate for that species than for any of the other larger-flowered species of subgenus *Dictyanthus*. Partly on the basis of this weak evidence and partly because of a later reference (Anonymous, 1857), I have tentatively considered *D. stapeliiflorus* to be synonymous with *Matelea pavonii*. This Anonymous (1857) reference purports to provide the first illustration of *D. stapeliiflorus*. It is implied but not stated that the illustration, taken from a living plant, is from the original material. Considering that the plant was apparently also growing in a German botanical garden and that only seven years had passed since Reichenbach’s description, it could well have been from original material. The illustration does not precisely

fit any species of *Matelea*, but most resembles *M. pavonii*. It is conceivable that this represents a distinct species that has never been re-collected, but, in the absence of specimens, I consider it an atypical representative of the variable *M. pavonii*. Although Woodson (1941) made a new combination, *Matelea stapeliiflora*, one cannot be certain as to what he intended the name to apply. In some cases he annotated specimens of *M. tuberosa* with this name, probably following Gray’s misapplication of the name (in Watson, 1887). In one other case, Woodson applied the name to a specimen of *M. yucatanensis*, a duplicate of which he properly determined. He also almost certainly had examined the specimen of *Langlassé* 257 at US, which had been tentatively determined as *D. stapeliiflorus*, but which is here described as a new species, *Matelea hamata*. Standley (1924) apparently (but tentatively) described the equivalent of my *M. hamata* under *D. stapeliiflorus*, and this could also have accounted for Woodson’s concept of the species.

In the late 1840s this species was introduced into European botanical gardens and was apparently a popular plant for about ten years. During this period, at least seven illustrations, mostly colored plates, were published in horticultural journals (Anonymous, 1852; Anonymous & Beaton, 1852; Morren, 1852; Planchon & Van Houtte, 1852–

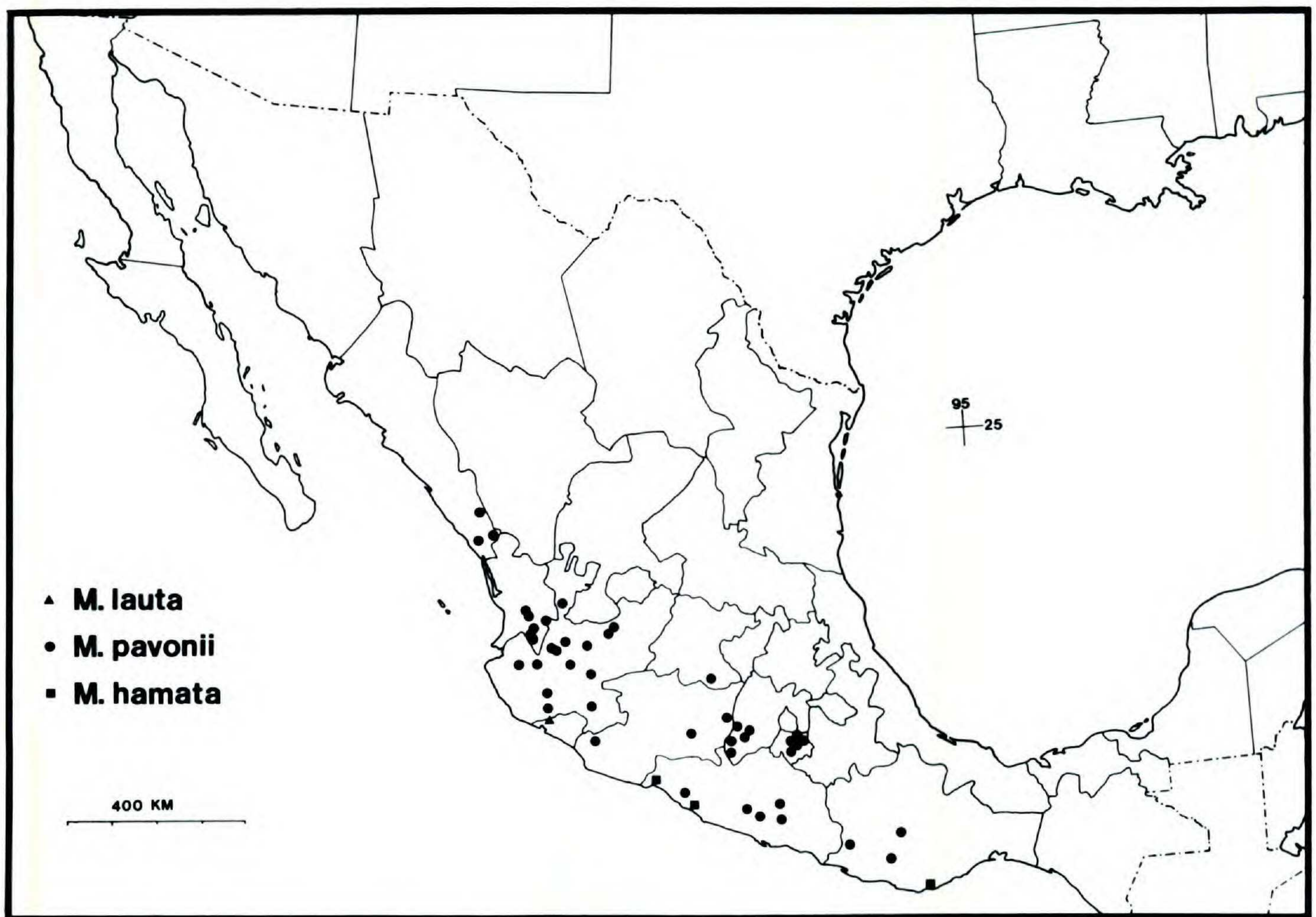


FIGURE 6. Distributions of *Matelea lauta*, *M. pavonii*, and *M. hamata*.

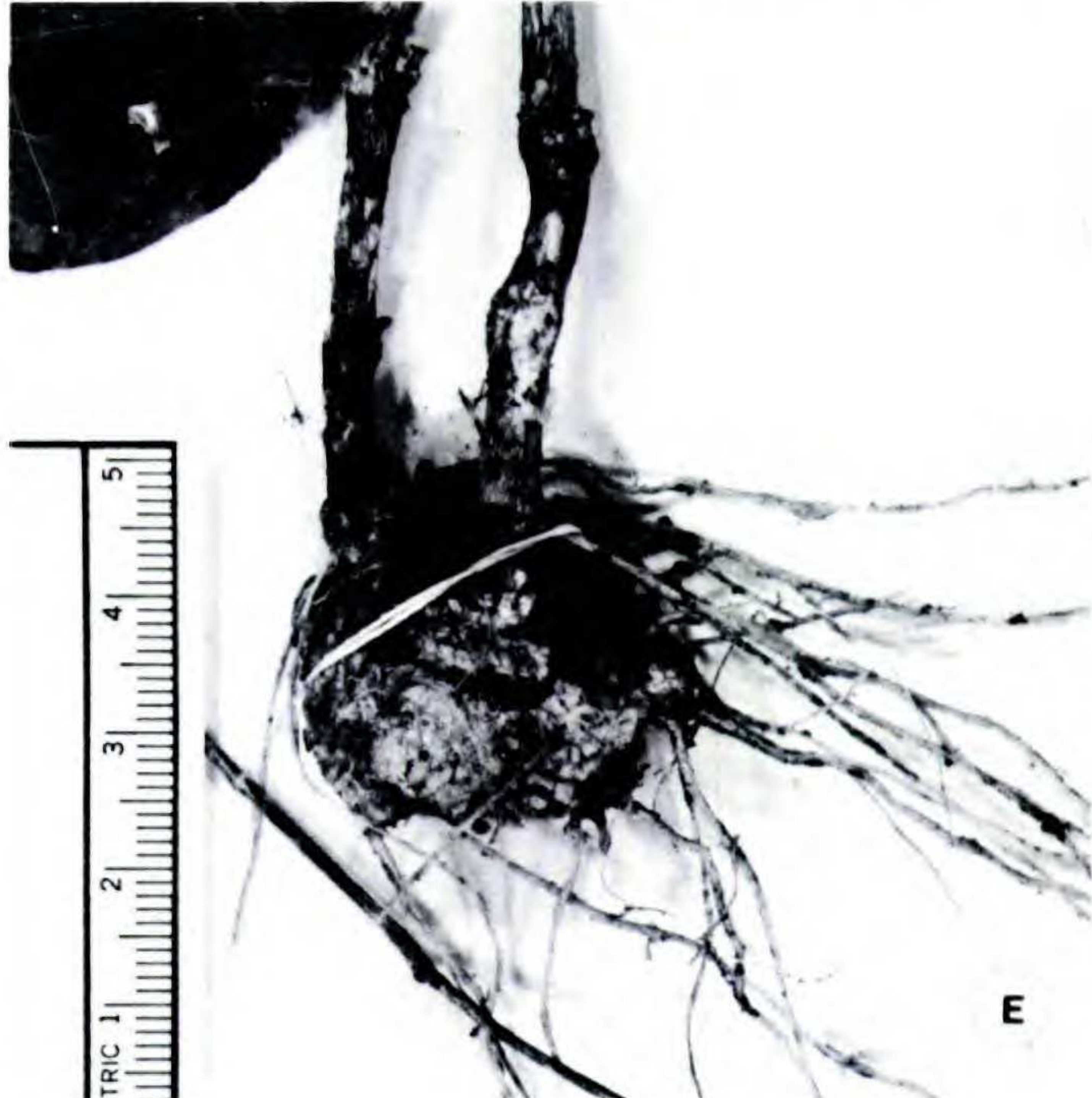
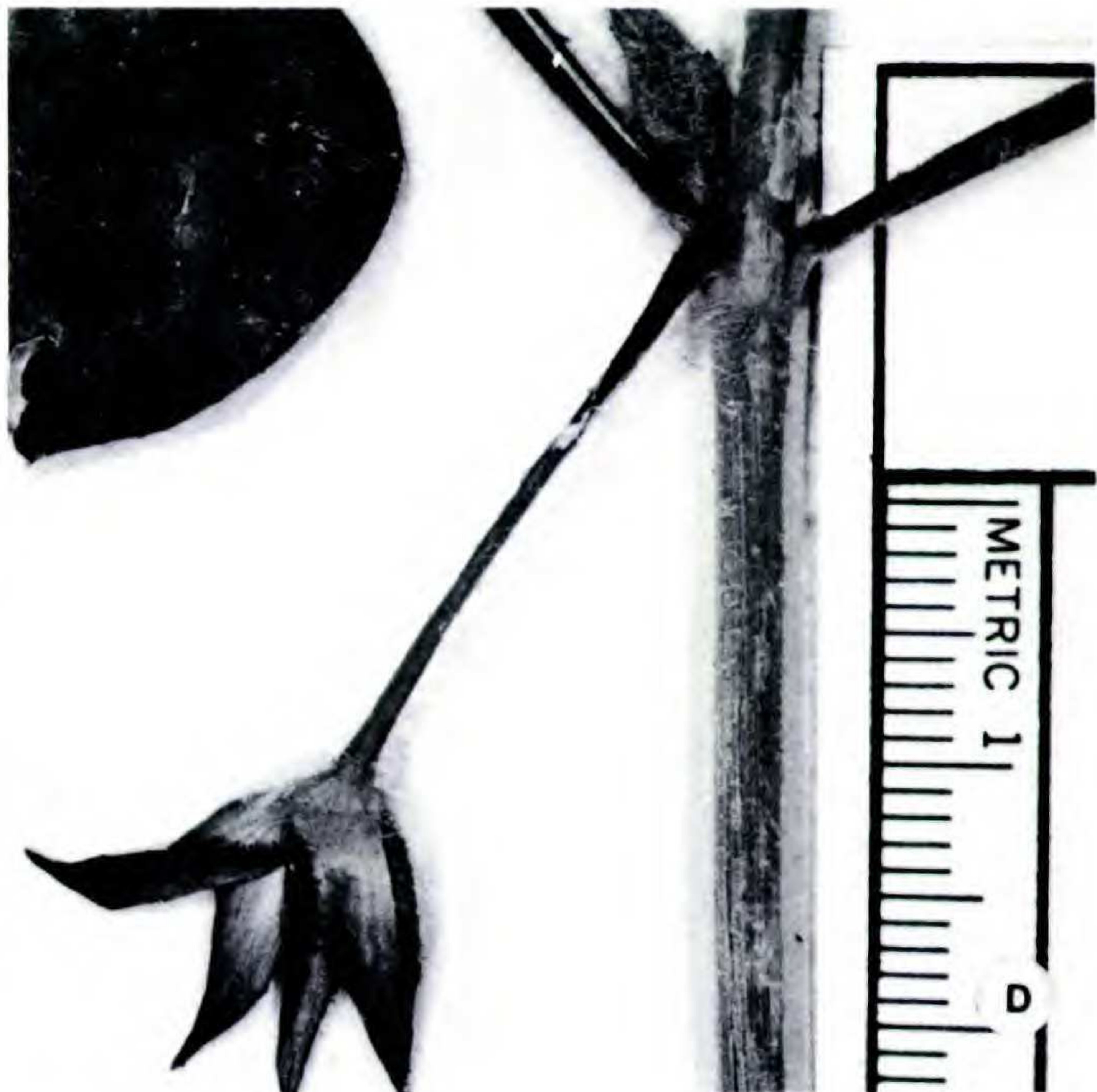
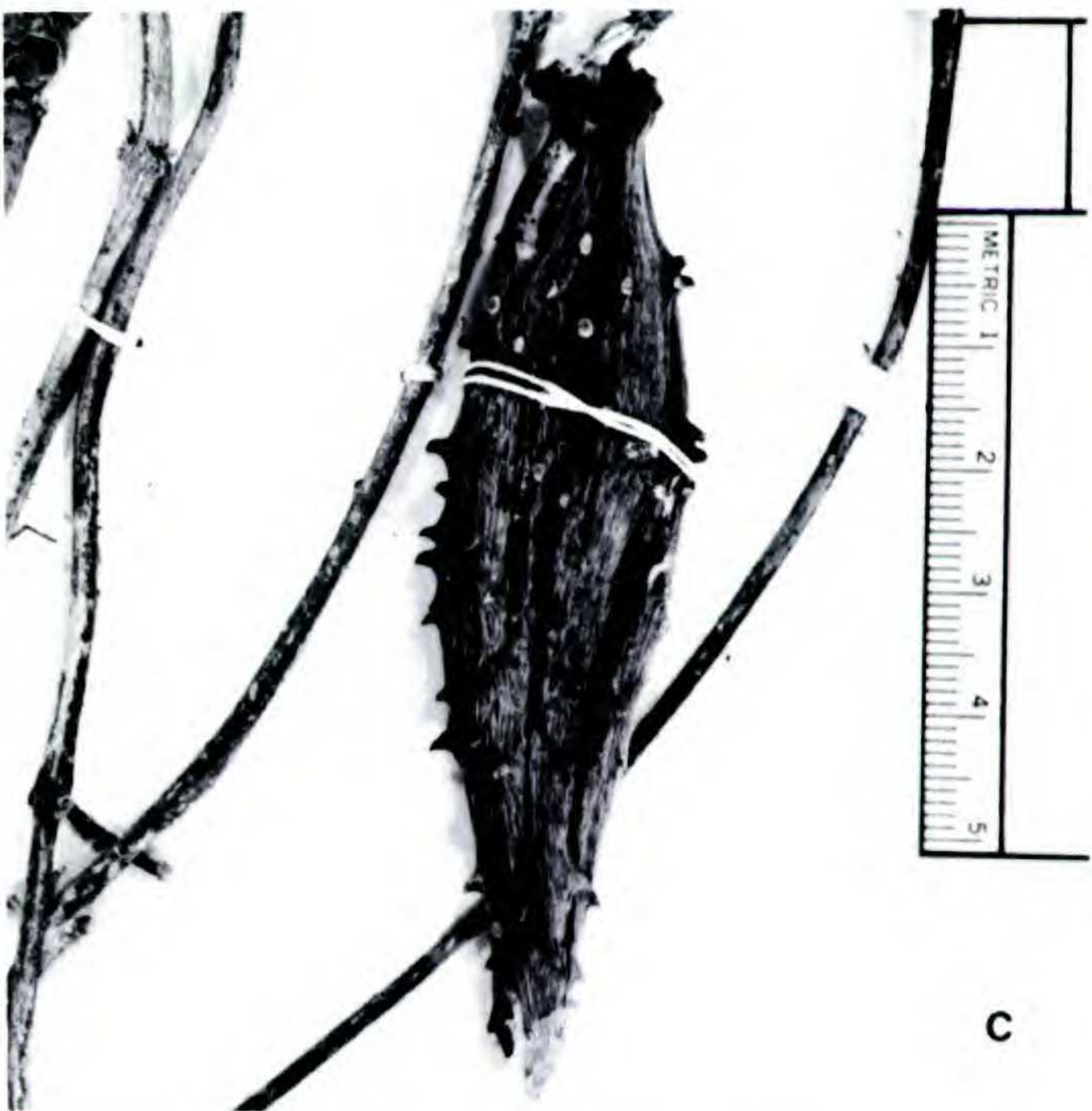
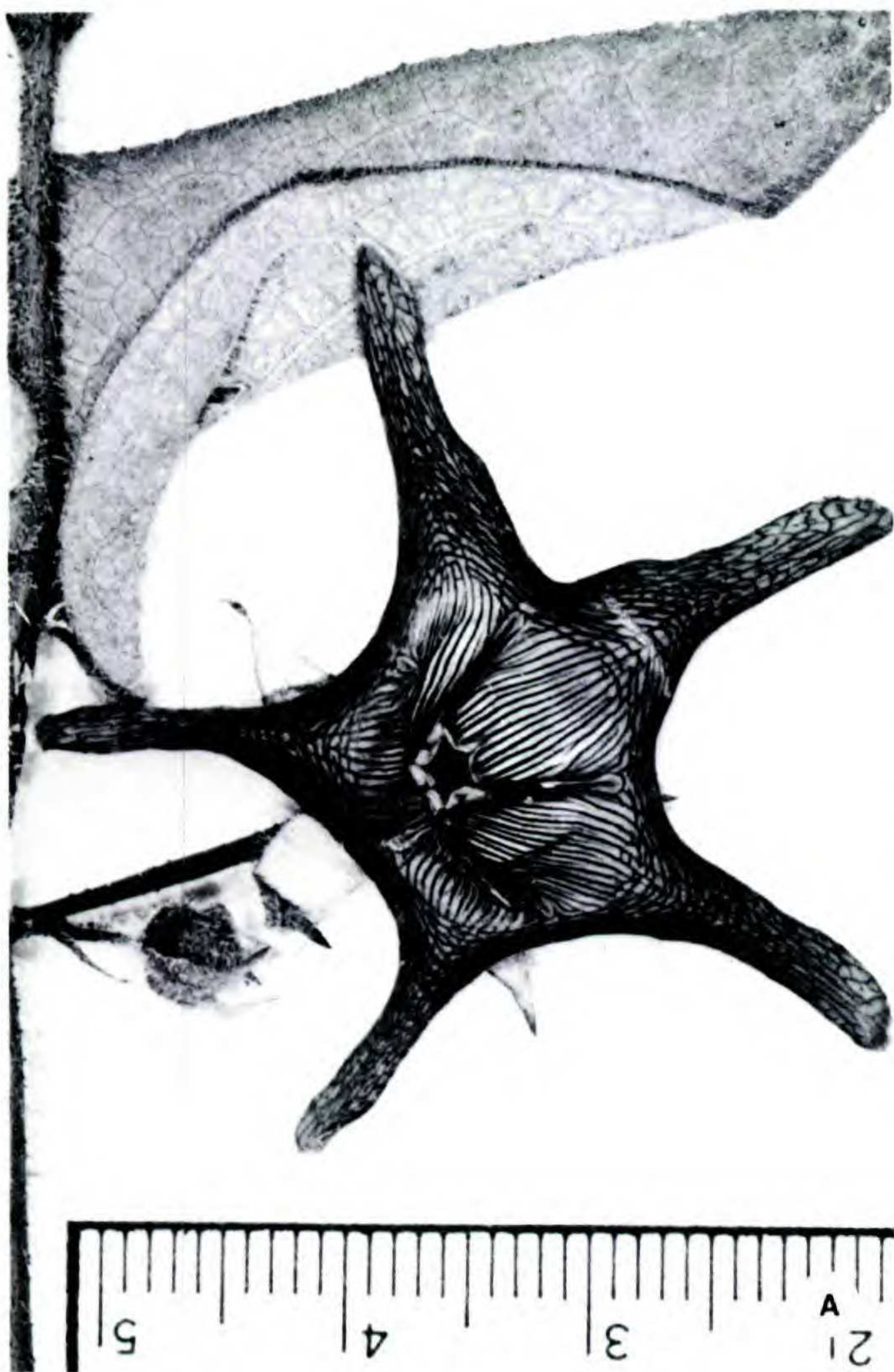
1853; Anonymous, 1853; Anonymous, 1857; Anonymous, 1862). The plants probably originated from one or two introductions, but little reliable information was provided.

This is the most common species of subgenus *Dictyanthus* and exhibits considerable floral variation throughout its range. The most conspicuous variation is in the background color of the corolla and in the color and density of corolla reticulations, but the basic color pattern is essentially constant. The presence or absence of teeth on the septum connecting the corona lobe to the gynostegium appears to have some geographical basis, all of the toothed specimens occurring from Jalisco and northward, but untoothed specimens occur throughout the range. In some populations, examples can be found with prominent teeth, with very small teeth, and with no teeth.

5. *Matelea macvaughiana* W. D. Stevens, sp. nov. TYPE: México. Jalisco: moist slopes near Guadalajara (between El Castillo and Juana-catlán, fide Davis, 1936, p. 199), 5 Aug. 1902 (fl), *Pringle* 8629 (holotype, MSC; isotypes, ENCB, F, G(4), GH, L(2), MEXU, MO, NY, P, PH(2), POM, UC, US(2), VT, W). Figure 7.

Matelea macvaughiana W. D. Stevens; *M. pavonii* affinis, a qua imprimis differt caulibus annuis erectis vel leniter volubilibus et caudice perenni ligneo, pagina folii laevi, pedunculis plerumque brevioribus (0–16 mm), trichomatibus longis pedunculorum et pedicellorum rectis, tubo corollae brevioris (9–12 mm e basi ad sinum), dentibus lateralibus loborum coronae duobus parvis et prominentiis folliculorum numerosioribus.

Plants erect to occasionally twining. Stems 20–85 cm long, with an herbaceous or woody caudex to 4 cm long and 2 cm wide, this with thin to moderately thick corky bark, occasionally with short woody stems above caudex, these with or without thin corky bark, herbaceous stems with dense short trichomes, sparse to dense glandular trichomes, and sparse to dense straight long trichomes to 3 mm long, these thin and often broken off on lower and older stems. Leaf blade ovate to wide-ovate or rarely narrow-ovate or very wide-ovate, 30–95 mm long, 21–72 mm wide, with sparse to dense uncinat long trichomes, surface smooth, smaller veins sharply raised below, apex acuminate to attenuate, base lobate, lobes mostly descending to widely divergent, with 2–6(–8) acropetiole col-leters, margin often somewhat thickened and rev-olute; petiole 9–37(–48) mm long, with dense short trichomes, sparse to dense glandular trichomes,



and sparse to dense uncinat long trichomes. Inflorescence often reduced to a single flower (then with or rarely apparently without a rudimentary peduncle); peduncle absent–16 mm long, with indumentum of stem or occasionally with long trichomes nearly absent; bracts linear to lorate or lanceolate, (2–)4–7 mm long, abaxial surface with dense short trichomes, sparse to dense glandular trichomes, and sparse to dense, straight or uncinat long trichomes, adaxial surface glabrous or with scattered short trichomes distally; pedicel (5.5–)8–20 mm long, with indumentum of peduncle. Calyx lobes lanceolate to narrow-ovate, 8–12 mm long, 3–4.5 mm wide, apex attenuate, with 1(2) collector(s) below each sinus, abaxial surface with dense short trichomes, sparse to dense glandular trichomes, and sparse to dense, straight or uncinat long trichomes, adaxial surface glabrous. Corolla campanulate, base to sinus length 9–12 mm, limb revolute; lobes 9–17 mm long, apex rounded or occasionally obtuse, patent, margin revolute; glabrous within except limb and lobes with moderately dense to dense short trichomes, indumentum outside of dense short trichomes on tube and limb and sparse to moderately dense uncinat long trichomes on limb and lobes; tube convoluted with the raised parts opposite the corona lobes and sacs formed between them; with gray or black vertical lines within the tube, these becoming circular on base of limb and reticulate on distal part of limb and lobes. Corona lobes (6–)7–9(–10) mm long, linear to linear-spathulate in outline, connate at base, adnate by a thin septum to gynostegium, this septum continuing as a narrow ridge about half the length of the lobe and with a pair of small thick teeth lateral to the upper margin near center. Gynostegium (2.5–)3–4 mm high and (3–)4–5 mm wide at apex, stipitate, apex broadly convex or nearly apiculate, the center apparently slightly shorter than to equaling the corpuscula. Corpusculum 0.23–0.26 mm long, 0.12–0.15 mm wide, pollinia 1.46–1.68 mm long, 0.43–0.49 mm wide. Follicles ca. 83 mm long, ca. 20 mm wide, striped pale and dark green, with dense short and glandular trichomes, with 118–144 arcuate projections to 3 mm long. Seeds 5.5–6 mm long, ca. 4.5 mm wide, with a raised, faintly radially grooved margin, this

entire or weakly toothed distally, inside this margin both sides flat or slightly convex, both sides verrucate to rugose, one side with a slight ridge from apex to near center, pale brown; coma 25–30 mm long.

Paratypes. MÉXICO. JALISCO: Huejotitán, July 1912 (fl), *Diquet s.n.* (MICH (2, one mixed with *Matelea pavonii*), P, US); ranch near Coyula (near Tonalá) ca. 12 mi. E of Guadalajara, July 1963 (fl), *Faberge s.n.* (TEX); wet seepage area 23 mi. S of Guadalajara on Hwy. 15, 5,300 ft., 13 July 1963 (fl), *Molseed & Rice 220* (ARIZ, MEXU, MICH, MO, NY, UC); wet meadows near Guadalajara (El Castillo, according to Davis, 1936, p. 118), 22 Aug. 1893 (fl), *Pringle 5431* (GH, VT). Michoacán: cultivated fields 6–7 km N of Jaripó, roadside thickets, 1,600 m, 1 Dec. 1970 (fr), *McVaugh 24934* (MICH, MSC).

The known collection localities are essentially centered in the region of Lago de Chapala at an elevation of about 1,600 m (Fig. 10). Apparently growing in seasonally wet meadows and grasslands; the erect or weakly twining habit and ground-level perennating parts are consistent with this open type of vegetation. Flowering July–August. Specimens with mature-sized fruit collected in December.

This species is named in honor of Dr. Rogers McVaugh for his extraordinary contributions to the flora of the part of Mexico in which this species is found, not the least of which are the many fine specimens of *Matelea*.

It is something of a quirk that this species requires description. Woodson recognized the species, but according to his annotation of the MO specimen of *Pringle 8629*, he considered it to be *Matelea dictyantha* Woodson, a new name based on *Rytidoloma reticulatum* Turcz. This apparently resulted from the fact that the two Pringle collections of this species were misdetermined as *Dictyanthus reticulatus* (Turcz.) Benth & Hooker f. ex Hemsl (actually “*Dictyanthus reticulatus* Turcz. (ex char.)” in the case of *Pringle 5431* and “*Dictyanthus reticulatus* B. & H.” in the case of *Pringle 8629*). Woodson, in providing the new name, cited both Turczaninow’s name and type (*Jürgensen 692*), leaving no question as to the application of the name. *Jürgensen 692*, which Woodson apparently never examined, represents another species of *Matelea*, which according to his

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FIGURE 7. Representative features of *Matelea macvaughiana*.—A. Flower (*Pringle 8629*, US).—B. Living flower, ca. same scale as A, negative taken from color positive, courtesy of Dr. Robert W. Cruden.—C. Fruit (*McVaugh 24934*, MICH).—D. Inflorescence reduced to a single flower (past anthesis), without a bract to indicate the presence of a peduncle—contrast with more typical inflorescence of A (*Pringle 8629*, VT).—E. Caudex (*McVaugh 24934*, MICH).

annotations he did not recognize, but which must nevertheless bear the name *M. dictyantha*. This left the species he did recognize without a description, type, or name, which are herewith provided.

Matelea macvaughiana is likely to be confused with *Matelea pavonii* because of the similarity of the shape and color pattern of the corolla but is amply distinct, most prominently by having a caudex, an erect or weakly twining habit, straight rather than uncinat long trichomes on several structures, smaller flowers on more reduced inflorescences, paired lateral teeth on the corona lobes, indumentum absent around the corona lobes, and more numerous and arcuate projections on the follicles.

- 6. *Matelea lauta*** W. D. Stevens, sp. nov. TYPE: México. Colima: steep ravines in gorge of Río Cihuatlán, near bridge 13 mi. N of Santiago, 200–300 m, 27 July 1957 (fl), *McVaugh 15826* (holotype, MICH). Figure 8.

Matelea lauta W. D. Stevens; differt a *M. pavonii* ordinatione venationes corolla, habitatione, pedunculis pedicellisque brevioribus, bracteis floribusque parvioribus; a speciebus omnibus subgeneris *Dictyanthi* calyce et pagina exteriori corollae glabra facile dignoscenda.

Plants twining vines. Stems woody below, with thick corky bark, herbaceous stems with dense, short, sparse glandular trichomes and sparse straight or uncinat long trichomes to 1 mm long. Leaf blade ovate to wide-ovate, 107–130 mm long, 71–88 mm wide, indumentum of sparse uncinat long trichomes above and dense uncinat long trichomes below, surface pusticulate along the veins, apex acuminate, base lobate, lobes descending to widely divergent, with 4–6 acropetiole colleters; petiole 47–81 mm long, with indumentum of stem. Peduncle 1–4 mm long, with moderately dense short and glandular trichomes; bracts lanceolate, 2.5–5 mm long, with sparse short trichomes abaxially, adaxially glabrous; pedicel 3–4.5 mm long, with moderately dense short and glandular trichomes. Calyx lobes lanceolate, 8–9.4 mm long, 2–3 mm wide, apex acute, with one colleter below each sinus, glabrous. Corolla campanulate, base to sinus length 15–18 mm, limb patent; lobes 14–18 mm long, apex acute, patent, margin revolute; glabrous within except with sparse short trichomes on lobes and in a line around corona lobes, glabrous without; tube convoluted with the raised parts opposite the corona lobes and deep sacs formed between them; with gray-brown vertical lines within tube, these becoming \pm angularly and uniformly reticulate on limb and lobes. Corona lobes 7–8 mm long, linear-

spathulate in outline, connate at base, adnate by a thin septum to gynostegium. Gynostegium ca. 4.5 mm high and 3 mm wide at apex, stipitate, apex apiculate, the apiculum ca. 0.5 mm long, equaling corpuscula, shriveled and apparently papillate when dried. Corpusculum ca. 0.33 mm long, 0.20 mm wide, pollinia ca. 1.27 mm long, 0.40 mm wide. Fruit and seeds unknown.

Known only from the type collection in lowland Colima (Fig. 6), flowering in July.

This new species appears to be closest to *M. pavonii* but can be immediately distinguished by the pattern of reticulations of the corolla. Most inflorescence and floral measurements of this species are notably smaller than the corresponding measurements of *M. pavonii*, and the glabrous calyx and outer surface of the corolla are unique in the subgenus. Additionally, the single collection was made at a significantly lower elevation than any known collection of *M. pavonii*.

- 7. *Matelea standleyana*** Woodson, Ann. Missouri Bot. Gard. 28: 237. 1941, based on *Dictyanthus tigrinus* Conzatti & Standley. *Dictyanthus tigrinus* Conzatti & Standley in Standley, Contr. U.S. Natl. Herb. 23: 1183–1184. 1924, not *Matelea tigrina* (Grisebach) Woodson. TYPE: México. Oaxaca: Dist. Tuxtepec, Laguna de Ojitlán, 350 m, 31 Oct. 1919 (fl), *Conzatti 3760* (holotype, US; isotype, GH). Figure 9.

Plants twining vines. Stems herbaceous and lacking bark, or sometimes rhizomes slightly woody and with thin corky bark; rhizomes thin, horizontal; stem indumentum of sparse to dense short and glandular trichomes and sparse to very sparse straight long trichomes to 1.5 mm long, these very brittle and mostly missing from specimens. Leaf blade wide-ovate to very wide-ovate or occasionally ovate, 48–104 mm long, 36–102 mm wide, indumentum of sparse uncinat long trichomes above and dense uncinat long trichomes below, surface smooth, apex acuminate to attenuate, base lobate, lobes mostly convergent to descending, with 1–7 acropetiole colleters; petiole 35–112 mm long, with sparse to dense short and glandular trichomes and sparse to very sparse, straight or uncinat long trichomes. Peduncle 5–18(–25) mm long, with indumentum of stem or often with long trichomes absent; bracts linear to lanceolate, 2–6 mm long, with dense short and sparse straight long trichomes; pedicel 7–16 mm long, with indumentum of stem. Calyx lobes narrow-ovate or occasionally lanceolate

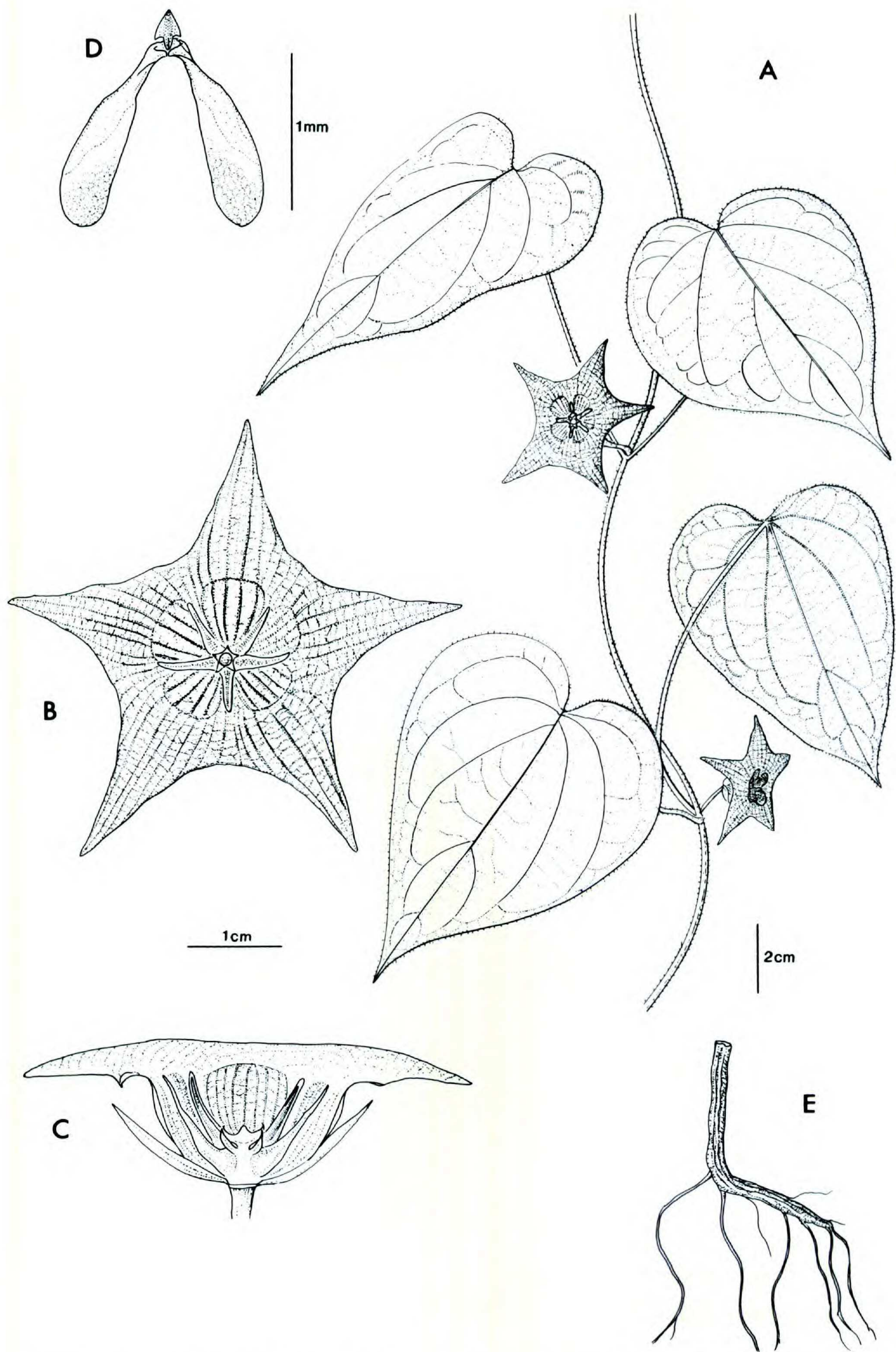


FIGURE 8. *Matelea lauta* (McVaugh 15826).—A. Section of flowering stem.—B, C. Flowers.—D. Bipollinium.—E. Base of stem.

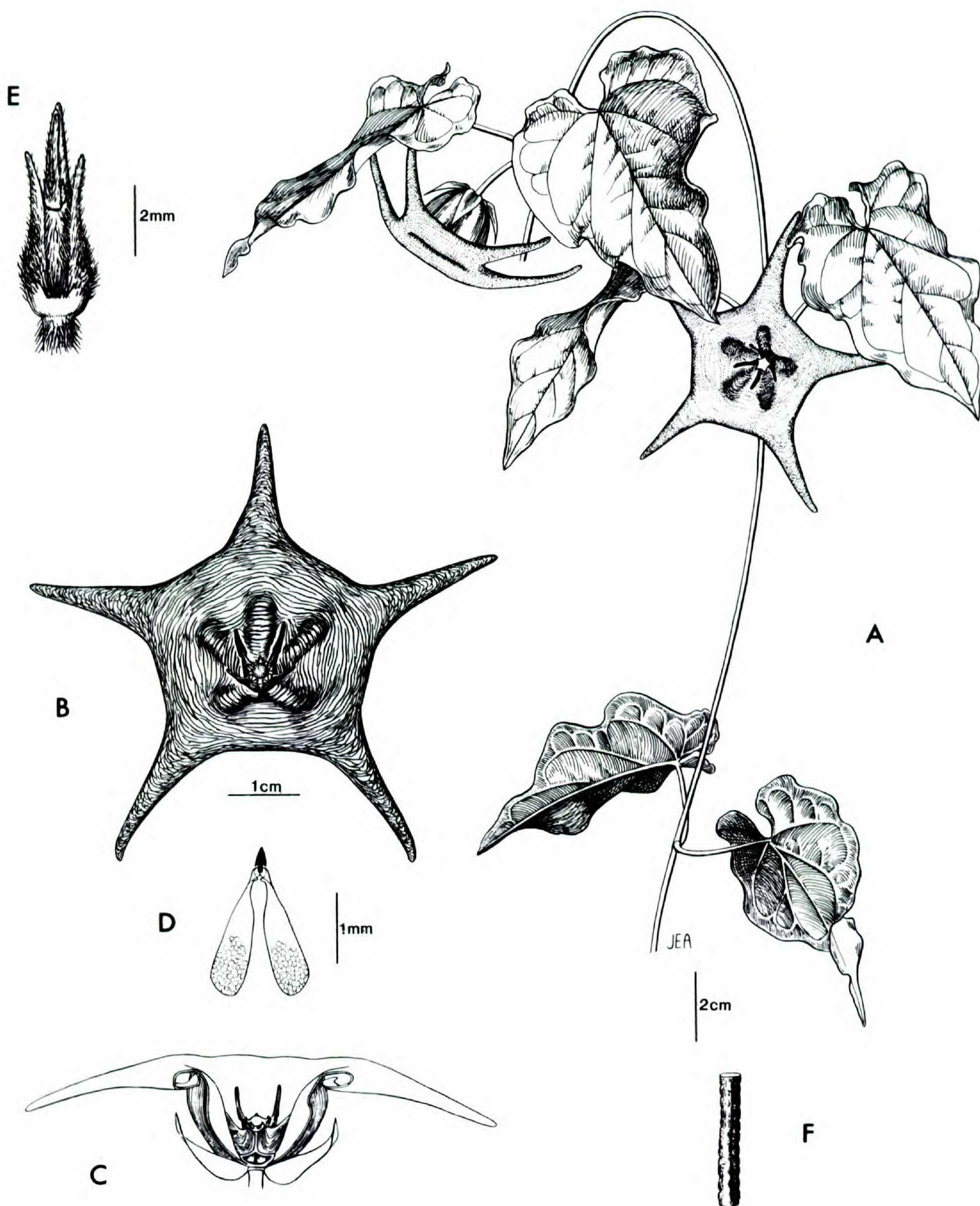


FIGURE 9. *Matelea standleyana* (Stevens C-161, a cultivated specimen of Stevens 1392).—A. Section of flowering stem.—B, C. Flowers.—D. Bipollinium.—E. Base of stem.—F. Base of adaxial surface of leaf blade,

or ovate, (8.5–)12–18 mm long, 4–6.5 mm wide, apex attenuate, with one colleter below each sinus, abaxial surface with dense short trichomes, margin with sparse straight or uncinat long trichomes, adaxial surface glabrous. Corolla deeply campanulate, base to sinus length (14–)17–31 mm, limb

revolute; lobes 17–28 mm long, apex acute, patent to reflexed, margin revolute; glabrous within except with moderately dense to dense short trichomes on lobes, limb, and around corona lobes, indumentum on outside of sparse to dense short trichomes; tube convoluted with the raised parts opposite the co-

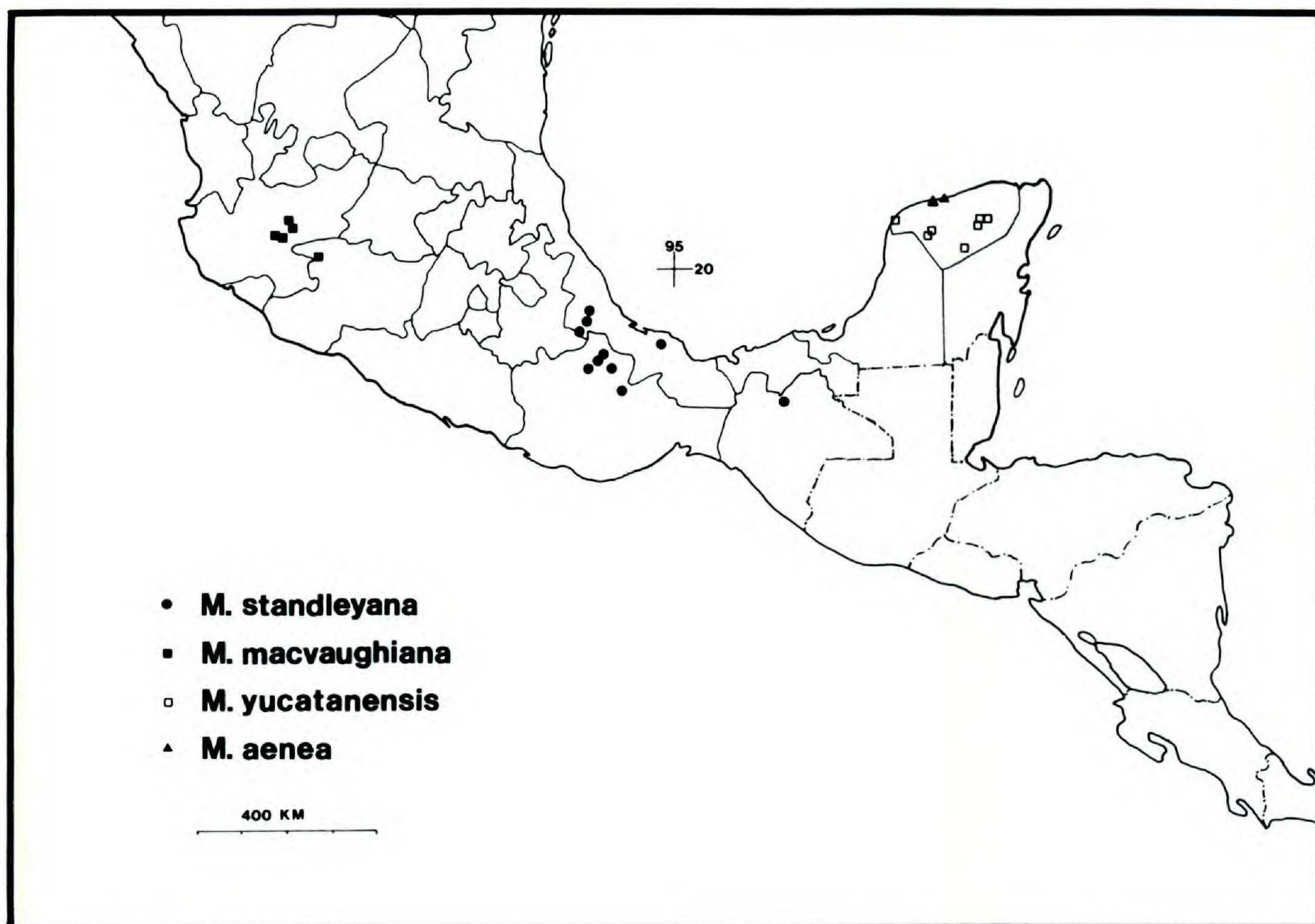


FIGURE 10. Distributions of *Matelea standleyana*, *M. macvaughiana*, *M. yucatanensis*, and *M. aenea*.

rona lobes and sacs formed between them; with thick, brown-red, circular lines within tube, these becoming thinner and reticulate on distal part of limb and lobes. Corona lobes 9–13 mm long, linear in outline, connate at base, adnate by a thin septum to gynostegium. Gynostegium (3–)4–5 mm high and 3–4.5 mm wide at apex, stipitate, apex with a blunt projection (formed from apices of anther wings) below each corpusculum and exceeding them laterally, apex convex with tip flattened and slightly bilobed and slightly exceeding corpuscula, terminal anther appendages covering ca. 1/3 of apex. Corpusculum 0.48–0.55 mm long, 0.23–0.28 mm wide, pollinia 1.54–1.88 mm long, 0.45–0.63 mm wide. Mature follicles unknown, immature follicles fusiform, to 85 mm long, to 28 mm wide, apparently green, with dense short trichomes, with ca. 50 very thick, straight projections to 7 mm long. Seeds unknown.

Apparently a plant of moist thickets restricted to northern Oaxaca and adjacent Veracruz, with one collection in northern Chiapas (Fig. 10), at elevations up to 1,220 m. Flowering specimens collected mainly in July and August, but also once each in June and late October. The one immature fruit was collected in August. Flowers of a green-

house-grown specimen were noticed to produce a faint foetid odor in late afternoon.

This species is readily identifiable because of the large, deeply campanulate corolla with circular markings within the tube. It is likely the largest-flowered New World asclepiad. Well-formed leaves of this species are, along with those of *Matelea pavonii*, the largest of the subgenus and have a uniquely angular sinus.

For a discussion of the Sessé & Mociño collections of this species, see *Matelea pavonii*.

8. ***Matelea ceratopetala*** (J. D. Smith) Woodson, Ann. Missouri Bot. Gard. 28: 236. 1941. *Dictyanthus ceratopetalus* J. D. Smith, Bot. Gaz. (Crawfordsville) 18: 208. 1893. TYPE: Guatemala. Santa Rosa: Santa Rosa, 3,000 ft., Aug. 1892 (fl), Heyde & Lux ex J. D. Smith 3999 (holotype, US; isotypes, G, GH, K, NY, US). Figure 11.

Plants twining or occasionally trailing or erect, frequently rooting at lower nodes. Stems 25–55 cm long when erect, woody and with thin to thick corky bark below or occasionally entirely herbaceous, herbaceous stems with dense short tri-

chomes, lacking to dense glandular trichomes, and very sparse to moderately dense, mostly straight long trichomes to 2 mm long. Leaf blade ovate to very wide-ovate, 25–63 mm long, 15–55 mm wide, indumentum above of sparse to occasionally dense straight or uncinata long trichomes and occasionally also sparse short trichomes, or rarely glabrous, indumentum below of sparse to dense mostly uncinata long trichomes, glandular trichomes lacking to sparse, surface smooth, smaller veins often moderately to sharply raised below, apex acute to attenuate, base lobate, lobes mostly convergent, with 1–4(–7) acropetiole colletes, margin often somewhat thickened and revolute; petiole 13–60(–70) mm long, with dense short trichomes, sparse to dense glandular trichomes, and very sparse to moderately dense, mostly uncinata long trichomes. Inflorescence sometimes reduced to a single flower but with a distinct peduncle; peduncle 1–15(–27) mm long, with dense short trichomes, sparse to dense glandular trichomes, and very sparse to moderately dense, straight or uncinata long trichomes; bracts linear to lanceolate, 3–5(–7) mm long, abaxial surface with short, glandular, and long trichomes, adaxial surface with short and occasionally also scattered long trichomes; pedicel 3–12(–15) mm long, sometimes accrescent in fruit, with indumentum of peduncle. Calyx lobes narrow-ovate or occasionally lanceolate, 9–13 mm long, 3.5–6 mm wide, apex acute or attenuate, with one colleter below each sinus, abaxial surface with scattered straight or uncinata long trichomes, adaxial surface glabrous. Corolla campanulate, base to sinus length 12–20 mm, limb revolute; lobes 11–18 mm long, apex acute, patent to reflexed, margin revolute; glabrous within except with scattered short trichomes on lobes, on limb (on veins only), and around corona lobes, indumentum on outside of sparse to dense short and scattered long trichomes; tube convoluted with the raised parts opposite the corona lobes and deep sacs formed between them; brown- or red-purple-reticulate, reticulations wider within tube. Corona lobes 8–11 mm long, linear-spathulate in outline, connate at base, adnate by a thin septum to gynostegium, this septum with a distinct tooth near center of upper margin. Gynostegium 3.5–5.5 mm high and 3–4.5 mm wide at apex, stipitate, apex apiculate, the apiculum 1–2 mm long and exceeding corpuscula. Corpusculum 0.41–0.46 mm long, 0.18–0.22 mm wide, pollinia 1.52–1.63 mm long, 0.40–0.49 mm wide. Follicles 75–90(–103) mm long, 20–27 mm wide, striped dark green and pale green or white, with short and glandular trichomes, with (36–)48–60 straight or occasionally arcuate projections to 7 mm long. Seeds ca. 4.5 mm long and 2.5–3.5 mm

wide, with a raised, radially grooved margin, this weakly toothed distally, inside this margin convex and verrucate on one side, concave and verrucate to rugose on the opposite side, concave side with a slight ridge extending ca. 1 mm from apex; coma 20–30 mm long.

Collected from southern Guatemala to southern Nicaragua (Fig. 13), mostly at elevations of 800–1,000 m but occasionally up to 1,400 m and down to near sea level, both extremes occurring in Nicaragua. Apparently not found on forests but rather in moist or dry fields, thickets, fencerows, stream-sides, and roadsides. Mostly associated with rocky volcanic soils but once noted as occurring on a salt flat. Flowering mostly mid July to early October but as early as June and as late as November. Collected with mature-sized fruit from mid September to December.

Until now, the plants here considered to be *Matelea dictyantha* have been included in this taxon. The two species are actually quite distinct, and *M. ceratopetala* has its closest affinities with *M. pavonii*. This problem is further discussed under *M. dictyantha*.

9. *Matelea eximia* W. D. Stevens, sp. nov.
TYPE: México. Chiapas: Fca. Fuarez, Esc. (Finca Unión Juárez, fide M. Sousa S., pers. comm.), 12 Aug. 1937 (fl), *Matuda 1778* (holotype, MICH; isotype, MEXU). Figure 12.

Matelea eximia W. D. Stevens; differt a *M. ceratopetala* ordinatione venationis super limbo corollae ordinate circulari (in illa irregulater reticulata), trichomatibus super limbo corollae aequaliter distributis (in illa limitatis ad reticulum), septis coronae integris, apiculo styli breviori, floribus ubique grandioribus.

Plants twining or trailing, rooting at lower nodes. Stems slightly woody below and with thin corky bark, herbaceous stems with dense short trichomes and very sparse straight long trichomes to 0.5 mm long. Leaf blade ovate, 45–58 mm long, 36–41 mm wide, indumentum above of sparse straight or uncinata long trichomes, indumentum below of dense uncinata long trichomes, surface smooth, apex acuminate to attenuate, base lobate, lobes convergent, with 1–4 acropetiole colletes, margin somewhat thickened and revolute; petiole 44–65 mm long, with dense short trichomes, sparse glandular trichomes, and sparse to dense (only distally) uncinata long trichomes. Peduncle 3–8 mm long, with dense short trichomes; bracts lanceolate to narrow-ovate, 2–3 mm long (probably larger, primary bracts unknown), with dense short and sparse long trichomes; pedicels 7–9 mm long, with dense

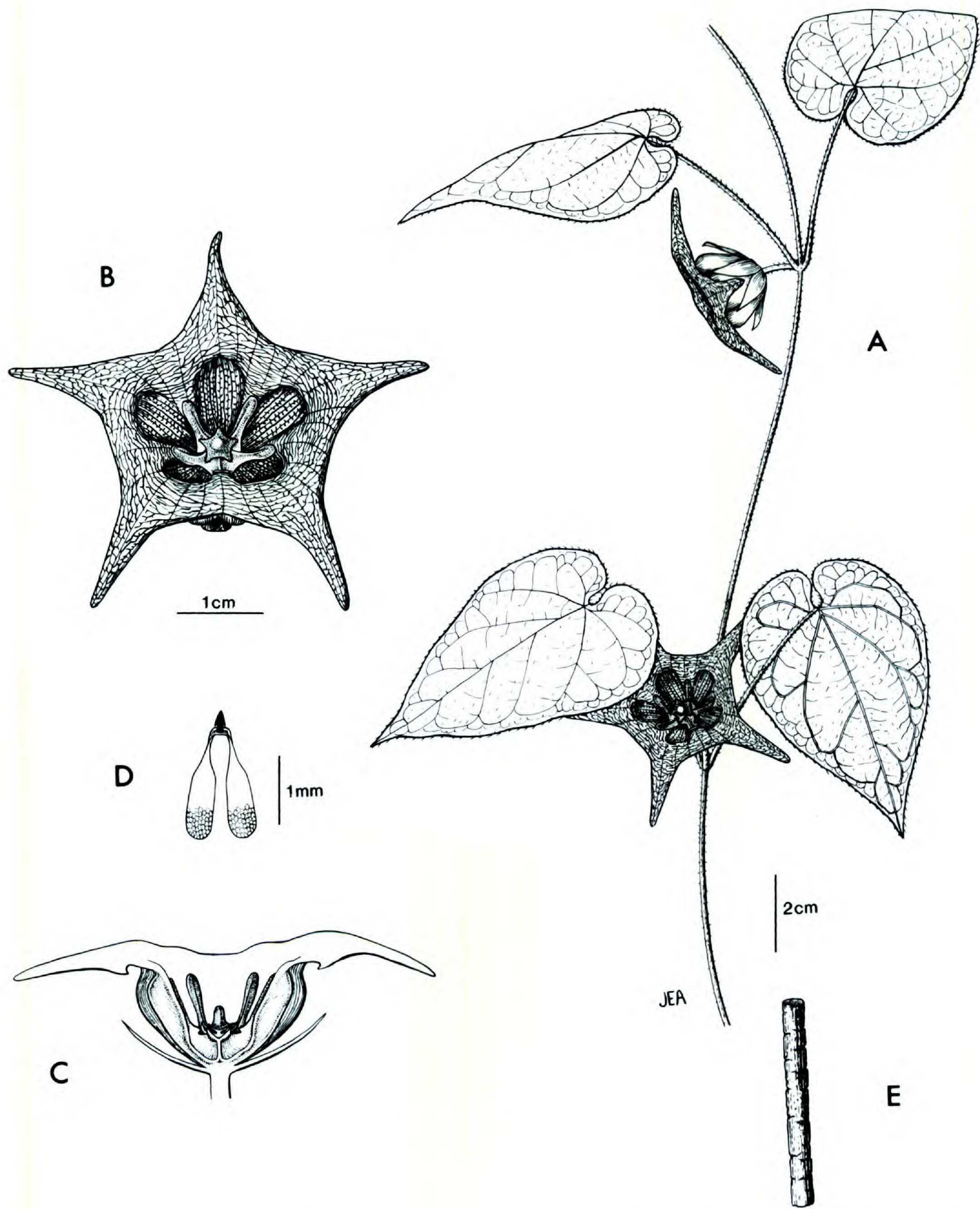


FIGURE 11. *Matelea ceratopetala* (Stevens 1245).—A. Section of flowering stem.—B, C. Flowers.—D. Bipollinium.—E. Section of old stem.

short trichomes and sparse straight long trichomes (only distally). Calyx lobes narrow-ovate to ovate, 9–15 mm long, 6–7.2 mm wide, apex acute or attenuate, with 1 colleter below each sinus, abaxial surface with scattered short trichomes and sparse straight or uncinat long trichomes, adaxial surface glabrous. Corolla campanulate, base to sinus length

16–20 mm, margin apparently revolute; lobes 14–23 mm long, apex acute, apparently reflexed with margin revolute; with uniformly distributed, moderately dense short trichomes within except glabrous in tube between corona lobes, indumentum outside of dense short trichomes; tube convoluted with the raised parts opposite the corona lobes and

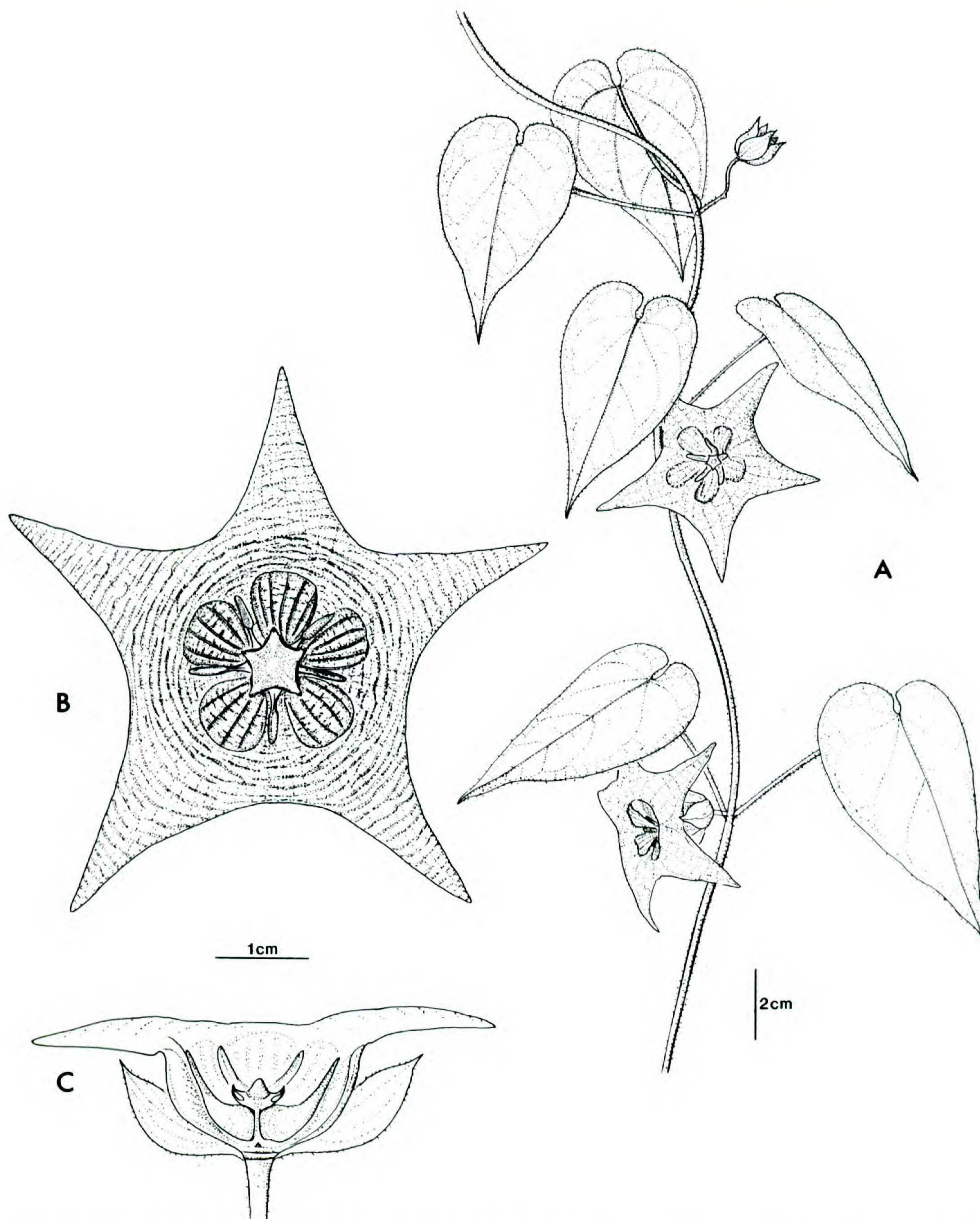


FIGURE 12. *Matelea eximia* (Breedlove 28682 and Matuda 1778).—A. Section of flowering stem.—B, C. Flowers.

deep sacs formed between them; apparently purple-reticulate. Corona lobes 6–7 mm long, linear-spathulate in outline, connate at base, adnate by a thin, entire septum to gynostegium. Gynostegium 4.5–5 mm high and 2.7–3 mm wide at apex, stipitate, apex apiculate, the apiculum ca. 0.8 mm long and

exceeded by corpuscula. Corpusculum ca. 0.37 mm long, 0.23 mm wide, pollinia ca. 1.17 mm long, 0.30 mm wide. Fruits and seeds unknown.

Paratype. MÉXICO. CHIAPAS: Mpio. de Motozintla de Mendoza, 25–27 km NE of Huixtla along road to Mo-

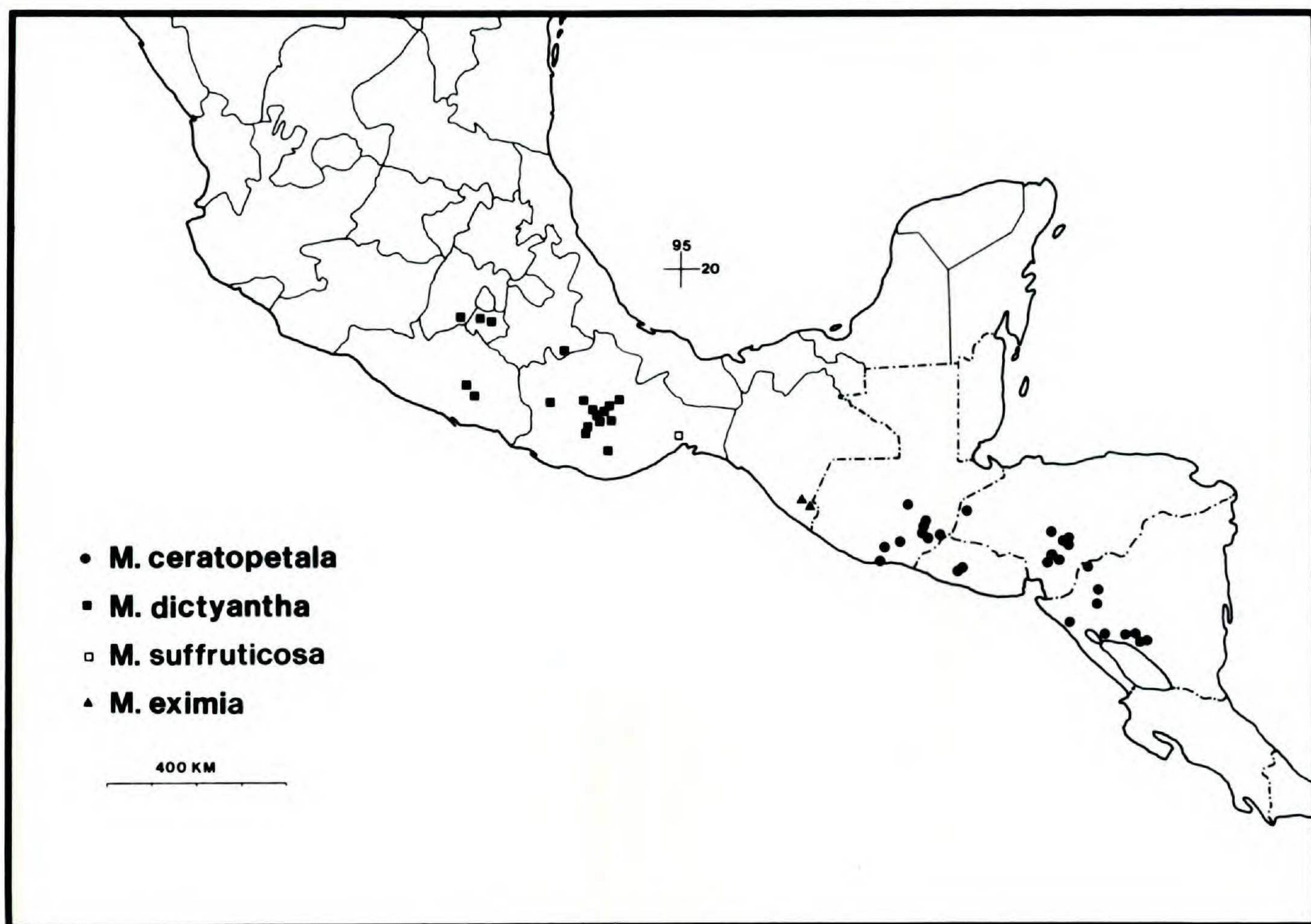


FIGURE 13. Distributions of *Matelea ceratopetala*, *M. dictyantha*, *M. suffruticosa*, and *M. eximia*.

tozintla SW of Toliman, 700 m, 7 Oct. 1972 (fl), *Breedlove* 28682 (DS).

Known only from the type collection and one other, both from the southern corner of Chiapas (Fig. 13).

This new species is clearly related to *Matelea ceratopetala*, with which it has a contiguous but apparently allopatric range. These two species are quite similar in general aspect and are the only ones in the subgenus where the trailing stems typically root at the nodes. The flowers of the two known collections of *M. eximia* are rather different in appearance, perhaps because the Matuda collection was bleached of corolla coloration during preservation. The Matuda collection thus has a corolla limb with the regular circular veins intersecting the vertical veins and producing a regular angular reticulation; the Breedlove collection has the same pattern of veins but the circular veins are pigmented while the vertical are not, resulting in a circular pattern. Both are different, however, from the irregular roundish pigmented reticulations of *M. ceratopetala*. The additional differences in limb indumentum, corona septa, and style apex apiculum leave little doubt that neither collection

pertains to *M. ceratopetala*, nor to any other species of subgenus *Dictyanthus*; but until *M. eximia* is better known, there must remain some doubt that the two collections are properly associated.

10. *Matelea dictyantha* Woodson, Ann. Missouri Bot. Gard. 28: 236. 1941, based on *Rytidoloma reticulatum* Turczaninow. *Rytidoloma reticulatum* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 25(2): 319–320. 1852, not *Matelea reticulata* (Engelmann ex A. Gray) Woodson. *Dictyanthus reticulatus* (Turczaninow) Benth & Hooker f. ex Hemsl., Biol. Cent.-Amer., Bot. 2: 329. 1882. TYPE: México. Oaxaca: “Sierra San Pedro Nolasco, Talea, etc.,” 1843–1844 (fl), *Jür Jensen* 692 (holotype, KW, not seen; isotype, K). Figure 14.

Plants erect to trailing or twining. Stems 15–70(–150+) cm long, with a woody caudex to 5 cm long and 3 cm wide, this with thin to thick corky bark, or occasionally with an elongate woody rhizome, also often with woody stems above caudex or rhizome, these usually with thin corky bark and up to ca. 5 cm long but occasionally up to 20 cm

long, herbaceous stems with dense short and glandular trichomes and sparse to dense, mostly straight long trichomes to 3 mm long. Leaf blade wide-ovate to very wide-ovate, 26–62(–103) mm long, 24–52(–76) mm wide, with long uncinat trichomes and also often glandular trichomes on veins below, surface smooth, smaller veins sharply raised below, apex acute to attenuate or rarely obtuse, base lobate, lobes mostly convergent to descending, with 1–6(–8) acropetiole colleters, margin often somewhat thickened and revolute; petiole (11–)14–34(–57) mm long, with dense short and glandular trichomes and sparse to dense uncinat long trichomes. Inflorescence sometimes reduced to a single flower with or apparently without a rudimentary peduncle; peduncle absent–10 mm long, with indumentum of petiole; bracts linear to lanceolate, 2.5–7 mm long, abaxial surface with indumentum of stem, adaxial surface glabrous; pedicel 5–12 (–16) mm long, sometimes markedly accrescent in fruit, with indumentum of stem. Calyx lobes narrow-ovate or occasionally lanceolate or ovate, 6–11 mm long, 2.5–6 mm wide, apex acute to attenuate, with one colleter below each sinus or occasionally these somewhat above sinus near margin of lobe, abaxial surface with indumentum of stem, adaxial surface glabrous. Corolla campanulate, base to sinus length (7–)9–16 mm, limb revolute; lobes 8–14 mm long, apex acute or sometimes rounded, patent to strongly reflexed, margin revolute; glabrous within except with sparse to dense short trichomes around corona lobes and on limb and bases of lobes or sometimes over whole surface of lobes, indumentum on outside of short trichomes and occasionally also with long trichomes on limb and bases of lobes, or occasionally tube and tips of lobes nearly glabrous; tube convoluted with the raised parts opposite the corona lobes and deep sacs formed between them; faintly to densely gray-purple-reticulate, reticulations wider within tube. Corona lobes (5–)6–8 mm long, linear in outline with a raised margin, connate at base, adnate by a thin septum to gynostegium, this septum continuing as a narrow ridge nearly the length of lobe. Gynostegium 3–4 mm high and 3–3.5 mm wide at apex, stipitate, apex broadly and shallowly concave with corpuscula as high points. Corpusculum 0.22–0.35 mm long, 0.09–0.17 mm wide, pollinia 1.17–1.45 mm long, 0.29–0.38 mm wide. Follicles (45–)55–70 mm long, 10–22 mm wide, pale green with a few dark green stripes, with short and glandular trichomes, with (30–)50–110 straight to arcuate projections to 3 mm long. Seeds ca. 5.5 mm long and 4–4.5 mm wide, with a raised, radially

grooved margin, this weakly toothed distally, inside this margin flat or slightly concave and verrucate on one side, convex and verrucate on the opposite side, the flat side with a slight ridge from apex to near center, pale brown to brown; coma 25–30 mm long.

Collected in the mountains of four more or less discrete areas: around Cuernavaca (Morelos and adjacent state of Mexico), around Chilpancingo (Guerrero), around Oaxaca (Oaxaca), and in southwestern Puebla (Fig. 13). Found at elevations of ca. 1,500–2,500 m. About a third of the collections are noted as being on or associated with limestone, and many of the other localities are in limestone areas, but whether or not *Matelea dictyantha* is restricted to limestone is uncertain. Mostly in low, open oak, pine, or pine-oak forests, especially where disturbed. Flowering mid June to mid September. Mature-sized fruits collected August–December, mature seeds only in December.

As mentioned under *Matelea macvaughiana*, Woodson provided the epithet for *M. dictyantha* quite by accident. He did not distinguish it from *M. ceratopetala*, to which it bears some resemblance in the shape and color pattern of the corolla and the size and shape of the leaves. The major characteristics distinguishing *M. dictyantha* from *M. ceratopetala* include the woody caudex and predominantly shorter habit, the smaller flowers, the lack of a tooth on the septum connecting the corona lobe to the gynostegium, the concave rather than apiculate gynostegium apex, and the smaller follicles with smaller and more numerous projections. The geographic ranges of the two species are also distinct. The distinctiveness of *M. dictyantha* from *M. ceratopetala* has been noted on two specimens, *Conzatti 2168* at F (unsigned and undated) and *Pringle 4768* at GH (J. M. Greenman, 18 Sep. 1890). Standley (1924) considered *Rytidoloma reticulatum* to be synonymous with *Matelea pavonii*.

The form of Turczaninow's protologue (1852) has led to some confusion. The apparent generic description is actually a description of the genus and its single species and cites *Jürgensen 692*. Immediately following the genus-species description is the entry "18. *R. reticulatum*. Altera species hujus generis, quantum e flore unico, Ptino corrupto, dijudicare possum, adest in collectione Galeottiana ex Oaxaca sub n. 1563." This led Langman (1964: 748) to state that *Rytidoloma reticulatum* was based on a Galeotti collection. Turczaninow was actually indicating that he recognized another

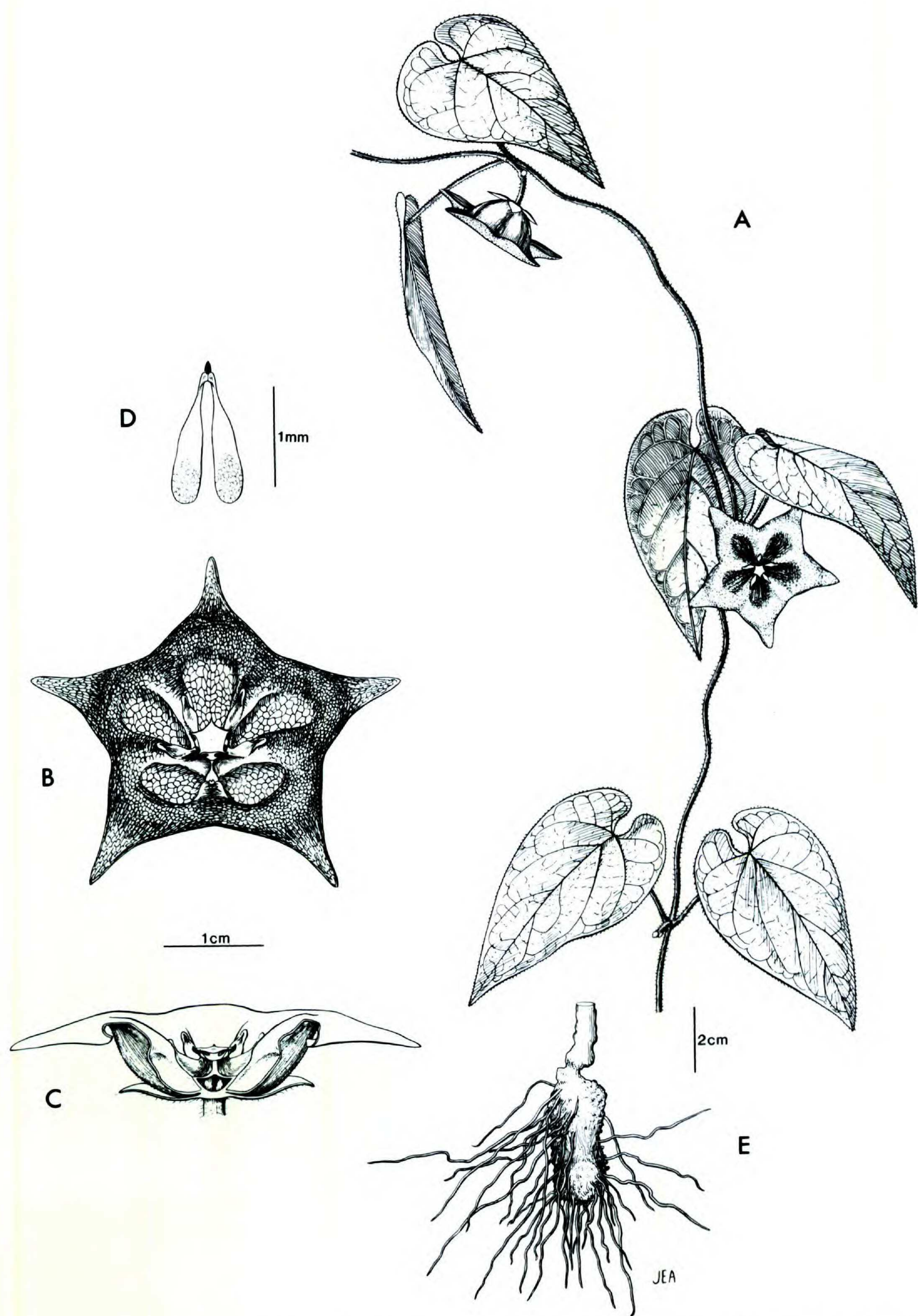


FIGURE 14. *Matelea dictyantha* (*A–D* from Stevens C-105, a cultivated specimen of Graham 1231; *E* from Stevens 1311).—*A*. Section of flowering stem.—*B*, *C*. Flowers.—*D*. Bipollinium.—*E*. Caudex.

species in his new genus, but he neither named nor described it. *Galeotti* 1563 is indeed a different species, *Matelea standleyana*.

As with *M. hemsleyana*, two somewhat distinctive elements of *M. dictyantha* can be recognized, but it does not seem that they warrant taxonomic recognition on the basis of currently available material. The flowers of the Morelos and Guerrero element tend to be larger, more shallowly campanulate, and much lighter in color than the Puebla-Oaxaca element. In this case the ranges are apparently distinct, but I have found no objective way of describing the difference in dried specimens. Perhaps with additional field study their separation will become more feasible. In this connection, it is most likely that the specimens of *Ghiesbreght* s.n. from "province d'Oaxaca" were actually collected at Cuernavaca, Morelos; such mixing of labels apparently often occurred with Ghiesbreght specimens.

11. *Matelea suffruticosa* W. D. Stevens, sp. nov. TYPE: México. Oaxaca: 4 mi. W of junction of Mex. 185 with Mex. 190, near La Ventosa, 17 Aug. 1971 (fl), *Wunderlin, Dwyer, Spellman & Vaughn* 800 (holotype, MO; isotype, MEXU). Figure 15.

Matelea suffruticosa W. D. Stevens; *M. yucatanensis* atque *M. aeneae* affinis coronae apicibus propriis sed inter species subgeneris *Dictyanthi* forma corollae (tubo anguste campanulato, limbo in sinibus abrupte reflexo, lobis erectiusculis) notabilis.

Plants apparently suffrutescent with twining tips. Woody stems with thin corky bark, herbaceous stems with dense short and glandular trichomes and moderately dense uncinata long trichomes to 1.5 mm long. Leaf blade ovate to wide-ovate, 40–51 mm long, 27–39 mm wide, indumentum of short and glandular trichomes on and near major veins and moderately dense (above) to dense (below) uncinata long trichomes, surface smooth, apex acuminate, base lobate, lobes descending, with 5–7 acropetiole colletes, margin somewhat thickened, revolute, and crispate; petiole 36–53 mm long, with indumentum of stem. Inflorescence sometimes with a smaller adjacent cyme apparently produced lateral to the axillary bud, that is, originating between the axillary bud and the normal extra-axillary inflorescence; peduncle to 1 mm long, with dense short and glandular trichomes; bracts linear to lorate, margins mostly revolute, 1–2 mm long, with short, glandular, and uncinata long trichomes abaxially, glabrous adaxially; pedicel 1.5–2.5 mm long, with indumentum of stem. Calyx

lobes decurrent on pedicel, elliptic to wide-elliptic, 3.3–4.5 mm long, 1.6–1.7 mm wide, apex acute, with one colleter below each sinus, abaxial surface with dense short, glandular, and uncinata long trichomes, adaxial surface glabrous. Corolla narrowly campanulate, base to sinus length 5.5–6.5 mm, limb sharply reflexed at each sinus; lobes 4–5 mm long, apex rounded, apparently erect, margins revolute; tube glabrous within, limb and lobes with stiff, erect, glassy, apparently unicellular trichomes 0.1–0.2 mm long, outer surface of corolla with dense short, glandular, and uncinata long trichomes; tube apparently suffused with deep purple, becoming purple-reticulate on limb and lobes. Corona lobes 3–3.5 mm long, linear-spathulate with tip deeply convoluted, glistening purple-black, separate to base, base (below style apex) yellow and glistening. Gynostegium ca. 2 mm high and 1.5 mm wide at apex, short-stipitate, apex nearly plane with corpuscula forming high points and center slightly convex, terminal anther appendages covering about half of apex. Corpusculum ca. 0.25 mm long, 0.17 mm wide, pollinia ca. 0.53 mm long, 0.37 mm wide. Fruits and seeds unknown.

Known only from the type collection, from the south side of the Isthmus of Tehuantepec (Fig. 13), probably below 100 m elevation.

This new species has some striking innovations but nonetheless fits easily into the subgenus and, despite its distinctive appearance, is probably closely related to the two species from the Yucatan. The exaggerated development of the corolla limb at the sinuses, which even at the bud stage is obvious as the sinuses have the appearance of recurved horns, causes the modified tips of the corona lobes to be presented in a unique fashion, at the distal margin of the limb, with which they contrast in color, between the erect and revolute corolla lobes. The hairs on the inside of the corolla, the occasional subsidiary inflorescences, and the roundish (rather than pentagonal) style apices appear to be unique in the subgenus but not in the genus as a whole. The highly modified tips of the corona lobes suggest a link between this species and the two Yucatan species, as does similarity in indumentum.

12. *Matelea aenea* (Woodson) W. D. Stevens, comb. nov. *Dictyanthus aeneus* Woodson, Amer. J. Bot. 22: 691, pl. 1, fig. 4. 1935. TYPE: México. Yucatán: Progreso, 11–15 Aug. 1932 (fl), *Steere* 3005 (holotype, MO; isotype, MICH). Figure 16.

Plants twining vines. Stems woody below, with thin to thick corky bark, herbaceous stems with

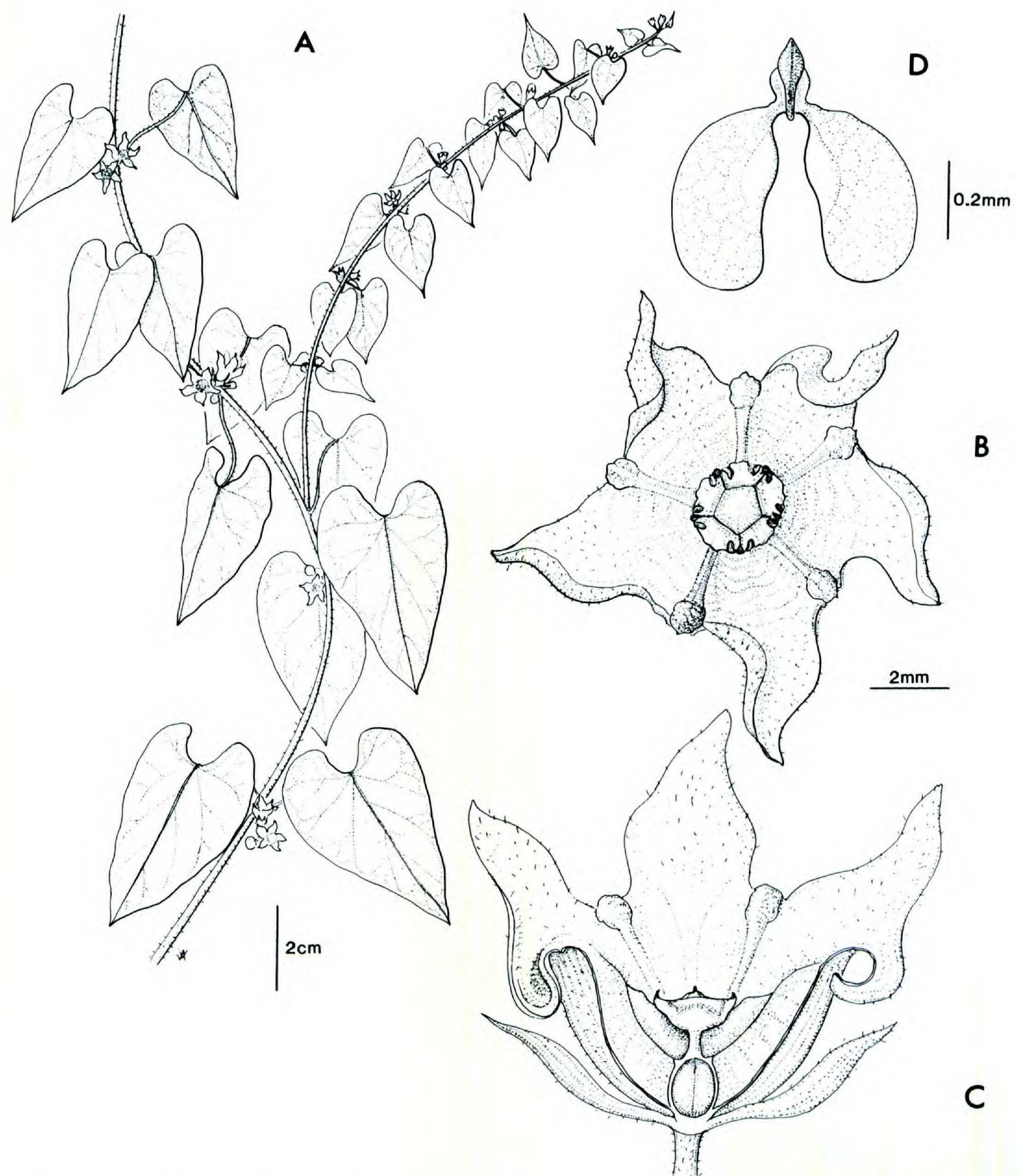


FIGURE 15. *Matelea suffruticosa* (Wunderlin et al. 800).—A. Section of flowering stem.—B, C. Flowers.—D. Bipollinium.

dense short and glandular trichomes and dense uncinata long trichomes to 2.5 mm. Leaf blade wide-ovate to very wide-ovate or occasionally ovate, 35–98 mm long, 26–70 mm wide, indumentum of uncinata long trichomes and of glandular trichomes on veins below, surface smooth, apex acute to acuminate, base lobate, lobes convergent to widely divergent, with 4–11 acropetiolar colleters, often crispate; petiole 21–62 mm long, with indumentum

of stem. Peduncle 4–11 mm long, with indumentum of stem; bracts linear to lanceolate, 3–4 mm long, with indumentum of stem or occasionally glabrous on adaxial surface; pedicel ca. 4 mm long, with indumentum of stem. Calyx lobes lanceolate to narrow-ovate, 6–9 mm long, 2–4.5 mm wide, apex acute to attenuate, with 1(2) colleter(s) below each sinus, abaxial surface with dense short, glandular, and uncinata long trichomes, adaxial surface

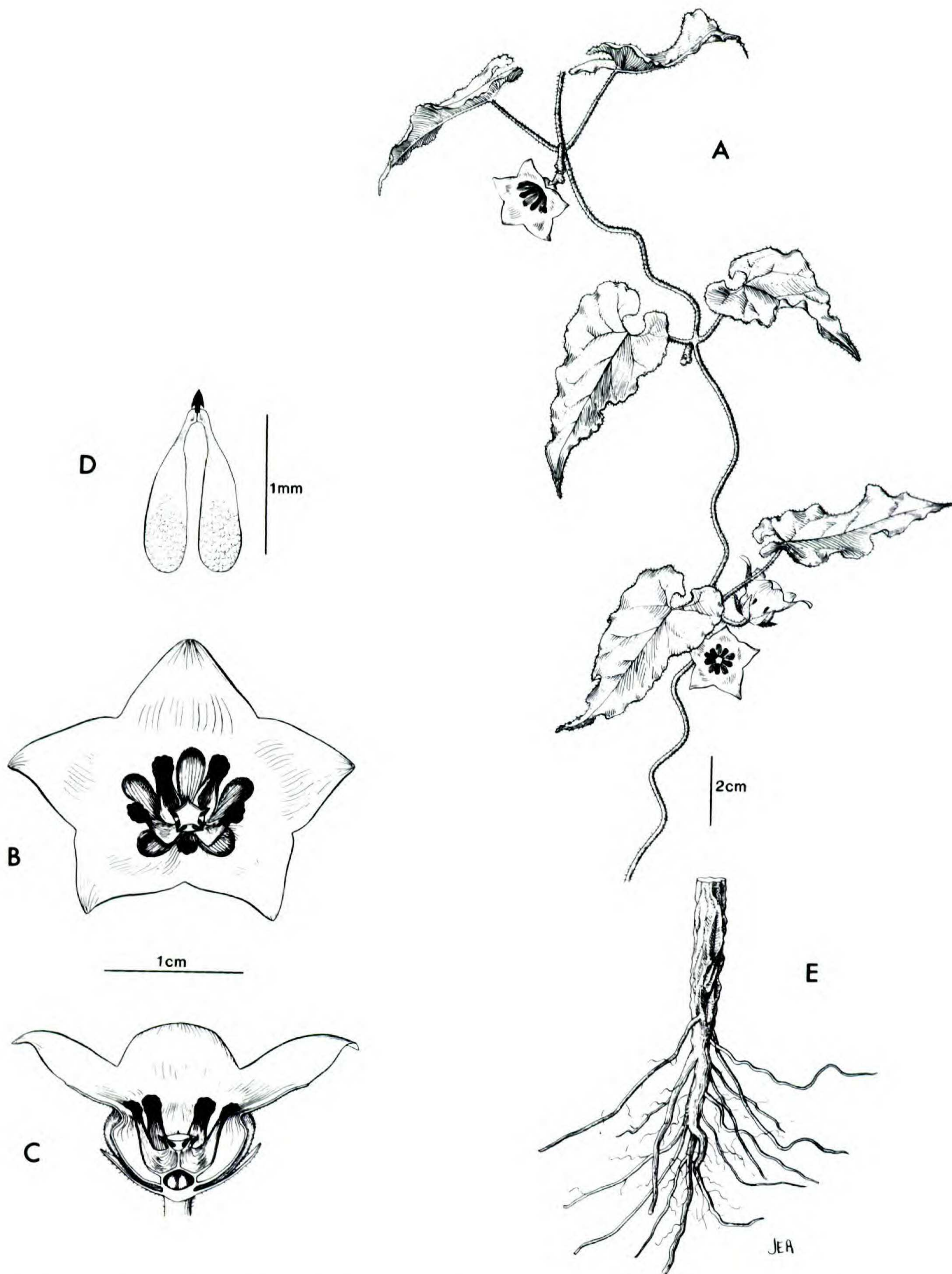


FIGURE 16. *Matelea aenea* (A–D from Stevens C-157, a cultivated specimen of Stevens 1145; E from Stevens 1145).—A. Section of flowering stem.—B, C. Flowers.—D. Bipollinium.—E. Base of stem.

glabrous. Corolla campanulate, base to sinus length (6–)8–12 mm, limb ascending to nearly patent, not revolute; lobes 5–9 mm long, length to width (sinus–sinus) ratio 0.67–0.78, apex acute or rounded, ascending to slightly reflexed at tip, margin not revolute; glabrous within except with dense short trichomes on limb and lobes, indumentum on outside of short, glandular, and uncinata long trichomes; tube convoluted with raised parts opposite corona lobes and forming deep sacs between them; pale yellow-green, sometimes with faint reticulations, these often drying darker. Corona lobes 6–8 mm long, linear-spathulate in outline with tip deeply rugose and glistening purple-black, otherwise yellow-green or tinted purple, connate at base, adnate by a thin septum to gynostegium, this septum continuing as a narrow ridge nearly the length of the lobe. Gynostegium ca. 3 mm high and ca. 2.5 mm wide at apex, stipitate, apex broadly and shallowly concave with corpuscula as high points and occasionally also slightly convex in center, terminal anther appendages hardly covering margin of apex. Corpusculum 0.21–0.28 mm long, 0.12–0.15 mm wide, pollinia 1.08–1.18 mm long, 0.35–0.37 mm wide. Follicles ca. 95 mm long, ca. 20 mm wide, finely mottled, probably green and white, with scattered short and glandular trichomes, with ca. 40 thick projections to 2 mm long. Seeds ca. 4.5 mm long and 3 mm wide, with a raised, radially grooved margin, this essentially entire, inside this margin essentially flat on one side and convex on the other, both sides deeply verrucate to deeply rugose, dark brown; coma ca. 40 mm long.

Collected only in the vicinity of Progreso, on the tip of the Yucatan Peninsula (Fig. 10), at near sea level. Growing in low scrub vegetation in thin, limestone-derived soils, apparently where not particularly saline. Collected flowering June–August and in December.

In describing *Dictyanthus aeneus*, Woodson (1935) summarized the differences as follows: “*T. aeneus* differs from *T. yucatanensis* Standl. [sic] superficially in the smaller and more shortly petiolate leaves with paler color and hispidulous or strigillose surfaces, and smaller, paler corollas with a more pronounced campanulate tube. Structural differences of the corolla and corona are conspicuous as well.” Later, Woodson (1941) considered *Dictyanthus aeneus* to be a synonym of *Matelea yucatanensis* (Standley) Woodson and so annotated the type specimen. I concur with his original recognition of *Dictyanthus aeneus*, but unfortunately his characters are not very diagnostic and,

in fact, his drawing of the flower (Woodson, 1935; pl. 1, fig. 4a) has the shape of *Matelea yucatanensis* and the size of *M. aenea*. The best characters for separating the two species are most easily observable in fresh flowers. The corolla limb and lobes of *Matelea yucatanensis* form essentially a right angle with the tube and have revolute margins, while those of *M. aenea* are ascending and do not have revolute margins. This difference can often still be seen in dried specimens when not carefully pressed. The corolla color is also strikingly different in fresh flowers, being yellow-green with faint reticulations in *M. aenea* and densely gray-purple-reticulate in *M. yucatanensis*. Unfortunately, *M. aenea* sometimes darkens in drying and this difference is partially obscured. The most dependable floral characters in pressed specimens are the size and shape of the corolla lobes, but even with these the flowers often require boiling to be measured accurately. As noted in the descriptions, *M. aenea* has shorter and proportionately wider corolla lobes. There seem to be certain vegetative differences as well, but the variation within each species is large and there are too few specimens to make possible any meaningful conclusions. *Matelea aenea* tends to have denser long trichomes on the vegetative parts and smaller, wider, more crispate, and less purple-pigmented leaves. Although obviously very closely related and the only two species of the subgenus *Dictyanthus* occurring on the Yucatan Peninsula, *M. aenea* appears to be restricted to the coastal area immediately around Progreso, while *M. yucatanensis* is found at scattered, mostly inland, localities. Both species are too poorly collected, however, to support much conjecture on their relative distributions.

13. *Matelea yucatanensis* (Standley) Woodson, Ann. Missouri Bot. Gard. 28: 237. 1941. *Dictyanthus yucatanensis* Standley, Publ. Field Columbian Mus., Bot. Ser. 8: 37. 1930. TYPE: México. Yucatán: without precise locality or date (fl), Gaumer 933 (holotype, F; fragment of holotype, G). Figure 17.

Plants twining vines. Stems woody below, with thin to thick corky bark, herbaceous stems with dense short and glandular trichomes and dense uncinata long trichomes to 2.5 mm long. Leaf blade ovate to wide-ovate or occasionally very wide-ovate, (39–)45–95 mm long, 24–81 mm wide, indumentum of uncinata long trichomes and also glandular trichomes on veins below, surface smooth, apex acuminate to attenuate, base lobate, lobes mostly

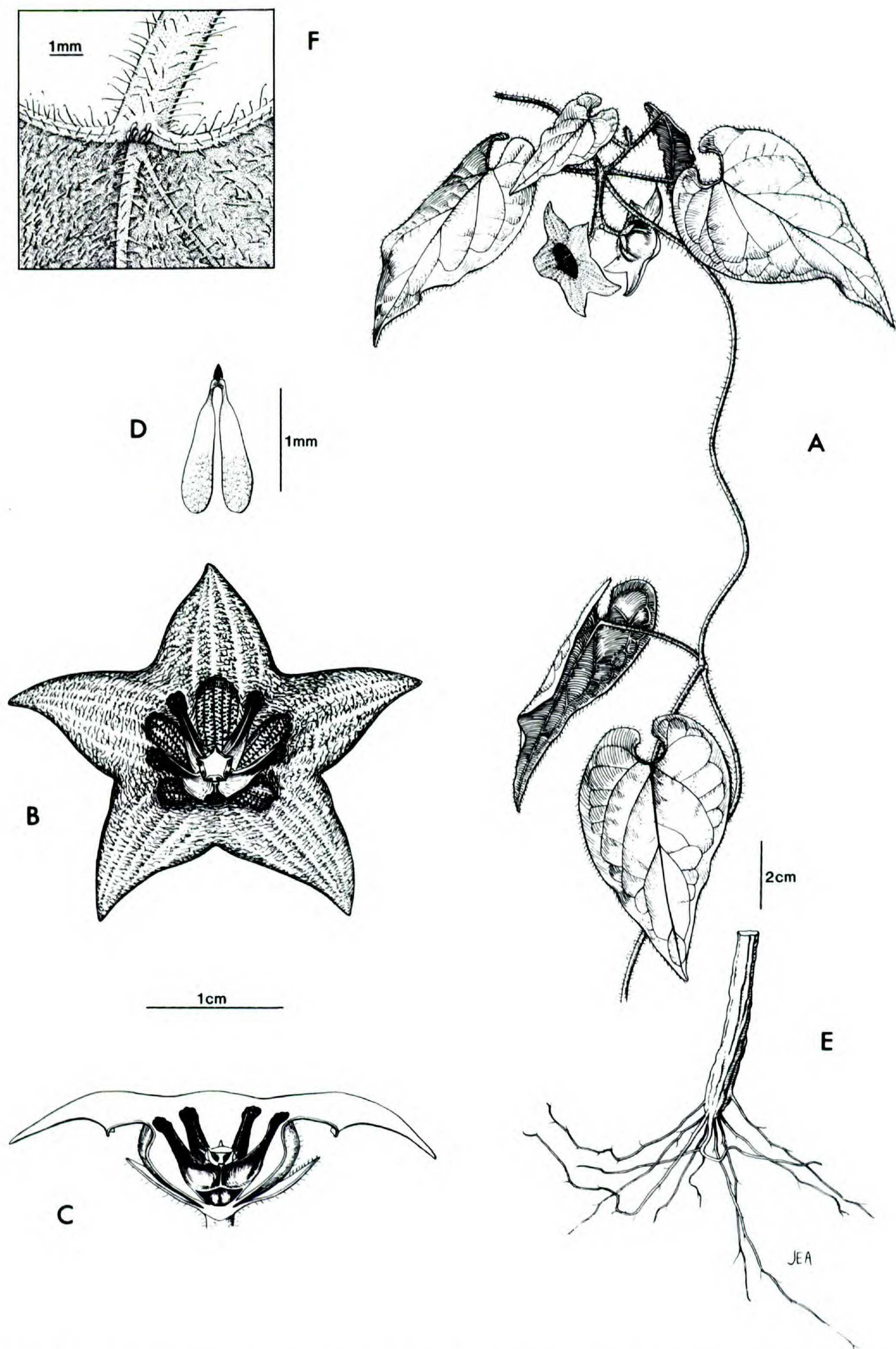


FIGURE 17. *Matelea yucatanensis* (Stevens C-158, a cultivated specimen of Stevens 1168).—A. Section of flowering stem.—B, C. Flowers.—D. Bipollinium.—E. Base of stem.—F. Base of adaxial surface of leaf blade, showing acropetiole colleters.

convergent to descending, with 4–10 acropetiole colleters, margin often crispate; petiole (22–)42–57(–82) mm long, with indumentum of stem. Peduncle 2–9 mm long, with indumentum of stem; bracts linear to lanceolate, 3–5 mm long, with indumentum of stem or sometimes with long trichomes on margin only and glabrous on adaxial surface; pedicel 3–5(–7) mm long, with indumentum of stem. Calyx lobes lanceolate to narrow-ovate, 7–10 mm long, 2–3.5 mm wide, apex acute to attenuate, with 1(2) colleter(s) below each sinus, abaxial surface with scattered short trichomes, dense glandular trichomes, and scattered uncinat long trichomes or occasionally nearly glabrous, adaxial surface glabrous. Corolla campanulate, base to sinus length (7–)10–11 mm, limb patent, revolute; lobes 7–12 mm long, length to width (sinus–sinus) ratio 0.83–1.20, apex acute, patent or slightly reflexed at tip, margin revolute; glabrous within except with sparse to dense short trichomes on limb and lobes, indumentum on outside of short, glandular, and uncinat long trichomes; tube convoluted with raised parts opposite corona lobes and forming deep sacs between them; densely gray-purple-reticulate, reticulations wider in tube. Corona lobes (4–)5–7 mm long, linear-spathulate in outline with tip deeply rugose and glistening purple-black, otherwise deep purple, connate at base, adnate by a thin septum to gynostegium, this septum continuing as a narrow ridge nearly the length of lobe. Gynostegium 3–3.5 mm high and 2.5–3 mm wide at apex, stipitate, apex broadly and shallowly concave with corpuscula as high points and occasionally also slightly convex in center, terminal anther appendages hardly covering margin of apex. Corpusculum 0.24–0.26 mm long, 0.12–0.15 mm wide, pollinia 1.11–1.26 mm long, 0.28–0.35 mm wide. Follicles ca. 95 mm long, ca. 15 mm wide, finely mottled green and white, with scattered short and glandular trichomes, with ca. 55 thick projections to 4 mm long. Seeds ca. 4.5 mm long and 3.5 mm wide, with a raised, faintly radially grooved margin, this entire, inside this margin essentially flat on one side and convex on the other, both sides deeply verrucate to deeply rugose, dark brown; coma ca. 35 mm long.

The identifiable collection localities are scattered in the state of Yucatan (Fig. 10), at elevations probably well below 200 m. Almost certainly to be expected in the adjacent areas of Campeche and Quintana Roo. Growing in low forests and second growth and probably always in limestone-derived soils. Collected flowering in June, July, and October and fruiting in October.

Most closely related to *Matelea aenea*; for comparison see discussion under that species. These two species form a distinct unit morphologically and are geographically isolated from the other species of subgenus *Dictyanthus*. They are obviously related to *M. suffruticosa* and the several species grouped with *M. pavonii* but have clear affinities only with the former. Their most conspicuous innovation, besides occupying a unique region and a unique environment (karst limestone), is the highly modified tip of the corona lobe. These tips glisten as if they are wet but apparently produce no secretion. They may function as “pseudonectaries.” It should be noted, however, that the sides of the corona lobes are secretory in apparently the same manner as the species grouped with *M. pavonii*. These two species, along with *M. suffruticosa*, are also unique in having predominantly uncinat long trichomes on the internodes, the other species considered here having either entirely straight or only occasionally a few uncinat long trichomes on the internodes.

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